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WHAT ABOUT HEALTH INSURANCE?*

ROGER I. LEE, M.D.

BOSTON

WORDS may be used to conceal a real meaning, sometimes intentionally and sometimes unintentionally. This is particularly true of those combinations of words that become slogans. This tendency is as old as words themselves, especially if there is a political relation. With the passage of time, a phrase often comes to connote something quite different from the actual meaning of the words. For example, the catch phrase "health insurance" really means quite the reverse; it is insurance to be used when one is sick. Now, the popular connotation of the term is the provision of medical care of some sort, whereas most other plans of insurance provide a cash indemnity or benefit. Certainly this is the connotation of life, fire, theft and other types of insurance. This is what the United States Government proposed to do when it offered insurance against enemy damage to property. If a social organization takes out rain insurance for its annual outdoor strawberry festival, in case of rain the organization gets a cash indemnity. Yet the state of Rhode Island's cash sickness-compensation plan is often designated as a health or sickness insurance plan, with the erroneous assumption that it provides either medical care or the money for that care, whereas the plan provides cash when the worker is ill.

One important reason for some of this confusion is doubtless that sickness is not easily defined. The so-called "private" insurance companies have been wrestling with this problem for many years. From the point of view of these companies, death is a definite affair, fire is somewhat less so, theft leads on to troubled ground, and sickness is a real difficulty. In so-called "life insurance," really death insurance, there is rarely doubt about the death of the insured person. To be sure, in rare instances there has been substitution and even the murder of an insured person for the insurance money. Then, too, there is the occasional person who, when he is told by a physician that he cannot survive, promptly takes out as large an insurance on his life as he can carry. But these cases are unusual, and the insurance companies are constantly putting increased safeguards against such practices.

In the less well-defined forms of insurance, one finds that the insurance companies have had to develop elaborate safeguards to counteract the cupidity and venality of some persons. It takes years to develop these safeguards. For example, the situation of automobile liability insurance is still confused and unsatisfactory in many ways. If and when automobile insurance becomes reasonably satisfactory with increased experience, there will be airplane insurance to be grappled with.

It has taken years to bring a semblance of order out of the workmen's compensation laws and regulations. There are complicated problems, some of which involve the relations of insurance-company doctors with private physicians, as well as the rights of the workingman to his freedom of choice of a physician. Although progress has been made, I believe that no one would claim that the situation is perfect or even satisfactory.

We are now in the midst of a war of extraordinary magnitude. So far as I know, no one questions the obligation of the Government to care generously for the soldiers who have suffered in the defense of their country. Most of us, I think, are prepared to give our soldiers the benefit of any doubt, so that any sifting device does not eliminate the worthy soldiers, even if some perhaps unworthy persons slide through. But even Congress seems confused concerning how far this insurance goes and what the distinction is between insurance against risks of war in the armed forces and so-called "security," however this may be defined, for soldiers and war workers at home. Certainly a grateful government must treat the disabled veterans liberally. If the experiences after other wars are any indicators, however, there will be many problems and many difficulties, and not all of them will be solved to the satisfaction of those concerned.

Some of these difficulties and problems will stem from misunderstandings and from differences in interpretation of the wording of some of the laws and of some of the regulations and directives. Others will arise directly from a lack of agreement about

*An address delivered at a meeting of the Suffolk District Medical Society, Boston, November 18, 1944.

the meaning of words and the inability to define precisely certain terms, such as "wound," "injury" and "sickness." The addition of the phrase "service-incurred disabilities" adds to the confusion. I recount these facts without comment, certainly no adverse comment, because it seems to me to help to clarify thinking on the whole insurance situation that is developing before us.

The inability to define illness precisely has always been a bugaboo of the medical profession. Even as medical science has progressed in the precision of diagnosis, there is always a shifting no-diagnosis land. In some cases it seems right in front of one; again, it seems just on the horizon. Doubtless it furnishes sustenance to quackery and charlatanism. The story is told of Dr. Henry J. Bigelow at the Massachusetts General Hospital, according to which a desperately ill patient, who had been treated by an irregular practitioner for "rheumatism of the liver," was admitted to the hospital. At the autopsy, on the insistence of Dr. Bigelow, the physician appeared. The liver was quite normal. Dr. Bigelow turned to the quack and made some scornful remarks. The quack replied: "Yes, Dr. Bigelow, the liver is normal. I cured that liver. I wish you had done as well with the malady that killed the patient." The medical profession points to the fantastic accounts of cures of various cults as evidence not usually of mistaken diagnoses on the part of doctors, but rather of the mistaken and often honest beliefs on the part of patients that they were really sick. Such convictions are sometimes dislodged by an emotional impact that is part of the stock in trade of the cultists.

The medical profession is therefore not surprised at the difficulties arising from the inability to define sickness in the area of insurance. Experience has taught that, whereas statistics may show a definite rate of sickness, under conditions of insurance this rate is increased, perhaps doubled or trebled. Furthermore, the explanation does not entirely lie in the fact that medical service without the fee-for-visit arrangement will reveal otherwise neglected sickness. Nor does the explanation depend entirely on the desire to get a return on money expended for insurance protection. It is necessary to study and digest these actuarial figures. The same difficulty is encountered in every army that supplies medical service for all and has no fee-for-service arrangement, particularly in the case of troops who are undergoing training that is vigorous, with the quality of leadership leaving something to be desired. We call it morale. Low morale occurs everywhere at times. Harsh orders, ill-advised punishments and scanty and "tough" medical consideration are not effective therapeutic measures in or out of the Army, but sympathy and firmness are helpful. Through the ages, the doctors have recognized all this and more. Perhaps the psychiatrist and social worker have given it a new emphasis. But it is as new or as old as the Golden Rule. Indeed, its application to insurance is not new. At one time, lodge doctors were common. The medical benefits were bait to attract members, and perhaps also a red herring across the trail of masculine social gatherings for the deception of the wife. Young doctors and unsuccessful ones took the jobs of lodge doctors as a possible introduction to practice. They were not paid much, and as a rule they rendered very little and very unsatisfactory service. Indeed, it was sometimes a degradation to depend exclusively on the lodge doctor, to "die to him," as we say in New England. But he was supposed to be better than nothing for the down-and-outers and the chronic medical tramps with many complaints.

But the insurance principle has in general worked well in a good many areas. Consequently, there was inevitably further trial of this principle in sickness. The large private insurance companies have experimented extensively with it. Despite substantial progress, I believe it to be true that the inherent difficulties and problems have not been solved and that accurate and reliable actuarial figures are still lacking. One substantial obstacle has been the lack of an explicit and usable definition of sickness. Certain applications of the insurance principle for sickness that have been tried and tested have had some success, even if not perfect success. If the insurance principle is applied to a homogeneous group like the students in a school, college or university, it is apt to work well, although by no means perfectly and not always smoothly. In a homogeneous unit, such as a lumber camp or a mining community, the principle seems to work on the whole fairly well, but it is impossible to generalize because local conditions defy all generalities. Then, too, any lack of homogeneity is always disturbing. For example, the inclusion of families in the operation of the plan makes for difficulties. Again, it is one thing when there is no medical competition nearby, and another thing if there is an existing community with other industries and other forms of medical care. Certain communities with a fairly common interest, however, are being well looked after medically by homogeneous groups of doctors on an insurance plan suited to the particular circumstances.

As a further illustration of what I mean by the homogeneous factor in the insurance principle and the difficulties in the lack of an adequate definition of sickness, I shall cite the example of the Blue Cross. Now, the Blue Cross concerns itself only with hospitalization. It excludes chronic illness and certain diseases. It pays or helps to pay the hospital rates in obstetrics, in acute illnesses like pneumonia, in the hospitalization of fractures and in surgical operations for acute conditions. It is popular because it helps pay for the acute catastrophic emergencies. It does not pay doctors' bills — sometimes, I fear, to the surprise and disappointment of the subscribers. It does not pay for sickness outside the

hospital, — that is, at home, — and it does not pay or help pay bills in hospitals that it does not recognize. The Blue Cross represents an insurance principle that sharply defines sickness — the patient must be hospitalized in an approved hospital with an acute and recognized sickness. It recognizes the homogeneous factor for the same reasons. Even though generally successful, the Blue Cross has not solved all the problems even within its own limited field.

Experimentation has gone even farther. Already various medical groups, notably some of the county medical societies and several of the state medical societies, have sponsored plans for the introduction of medical care in communities, districts, counties and states. These experiments have had many obstacles to overcome and have met with many vicissitudes. As a result of experience at the present time, most plans begin by limiting themselves to obstetrics and surgery — that is to say, sickness that can be more or less explicitly defined. Some of these plans show considerable promise. In any event, they seem to be based on a firmer foundation than the scores of earlier plans under all kinds of auspices that have passed into oblivion. Furthermore, these newer plans, in their pioneering work, test out by trial and error their feasibility and the desires of the public, and they are producing valuable data, including actuarial figures. Some of these plans by affiliation with the Blue Cross are able to furnish complete coverage of hospital and doctors' bills. But, as I have said before, all the problems are not solved. Obviously, a Blue Cross subscriber may prefer hospital residence for a minor operation or a minor illness that might be cared for at home, but he is a subscriber and is entitled to consideration. The hospitals may be overtaxed by this load; indeed, a new type of hospital or hospital wing or ward may be needed. The present "super" hospitals may be too expensive to operate for minor classes of medical illness or of surgery. As you all know, here in this state the Massachusetts Medical Society has fostered and sponsored a plan for state-wide prepayment insurance for low-income groups on a nonprofit basis. Dr. James C. McCann, of Worcester, has borne the heavy burden of inaugurating this plan, called the Blue Shield. The Blue Cross has made generous contribution not only of experience and advice but also of its personnel and organization. A sound and substantial beginning has been made. So far, the Blue Shield accepts only surgical and obstetric cases. To be sure, these are the large catastrophic financial items, if one permits the use of the word "catastrophic" as applied to obstetrics. It is certainly the intent to progress farther into the realm of sickness when experience warrants such a move. Of course, there will be difficulties. Once again the specter of definition raises problems. What is the ceiling — to employ the modern jargon — of low-income groups? And incidentally what is the floor? In any event, the doctors are proceeding with their experiment. They have put real money — their own money, too — into the experiment and promise a good try at a possible solution. The members of the medical profession in some other states, in some counties, in some communities and in some areas are also experimenting with similar plans, with varying success. Some of the earlier plans under medical auspices based rather on sentiment and enthusiasm than on actuarial figures and cautious experimentation have passed into oblivion, but these should be remembered as revealing many pitfalls not readily apparent to the unwary.

One of the products of these activities — or perhaps one of the many stimulating forces — has been the advocacy in some quarters of a universal health-insurance plan on a nationwide scope. There is nothing new about compulsory health insurance, so called. It has been agitated in this country for fifty years at least. In the 1880's Germany adopted a plan of sickness insurance that was carefully studied and that seemed to work well for the Germans, particularly in the case of tuberculosis. The rather sudden drop in the incidence of tuberculosis in all countries irrespective of health insurance and the ability of this country largely to meet this problem on a state or even a smaller unit level seemingly discouraged enthusiasm for such a plan here.

The adoption of compulsory health insurance in the British Isles thirty years ago, however renewed the discussion. Other European countries before and since have adopted varying schemes of compulsory sickness insurance, usually on a nationwide level. The course of compulsory health insurance in Britain has been followed with great interest in this country. Contrary to the expectations and even the promise of its proponents, it has been concerned with sickness and not with health. The public-health activities have been minimized rather than emphasized. The death rate has not been lowered so rapidly as that of the United States. There has been much discussion and much acrimony on both sides of the question and on both s des of the Atlantic. The operation of the British act has not been free from politics; it has not improved medical practice and indeed has been a good deal of a deterrent to the public-health movement. There have been the usual difficulties of all insurance plans. At the present time, changes in the British act are contemplated and are being discussed. The medical profession of Great Britain does not find the act satisfactory but is reluctant to encourage drastic changes that it fears would eventually result in more governmental and political control It pleads for cautious experimentation and for action only after study of the actuarial data, and for freedom from political manipulations. The medical profession in Great Britain wants clarification of governmental act vities in respect to poverty and medical service.

In other words, the doctors object to the government's giving medical care as a dole to the poor, instead of providing them with the necessities of life — shelter, food, fuel, clothing and so forth. It is necessary, they claim, to separate poverty and the measures used to alleviate poverty from sickness and the measures used to alleviate sickness. Doubtless there is a connection between poverty and illness. One may well be the cause of the other, but poverty is not always the cause of illness. And certainly financial security does not ensure freedom from disease or freedom from worry.

Sir William Beveridge, the well-known British economist, and his plan decidedly stimulated the discussion. If I understand the plan correctly, it is an attempt to show how the insurance principles may be used, primarily against poverty and incidentally against unemployment, old age, the bringing up of children and so forth, including illness. Sir William recognizes five giants of evil — want, disease, ignorance, squalor and dleness. He claims that want or poverty is probably the easiest to attack. His plan is focused primarily on poverty and incidentally on sickness. He does not himself seem to have any opinion about its workability. Indeed, in a lecture in London some years ago he declared that it was not the business of the professional economist to develop legislation to any end. I believe, however, that Sir William has recently been elected to Parliament, so he may have changed his mind. Then, being an Englishman, he is a bit hazy on the role of hospitals in illness. One of the proponents of the federal compulsory-insurance law in the United States wrote to me that it did seem that Sir William was rather vague on the subject of hospitals. In the United States, of course, the hospital is on the front line in the battle against illness. In any case, it is difficult or impossible to transfer the experience of one country to another. Even in Great Britain, the Compulsory Insurance Act in a number of respects is different in Scotland from what it is in England, although both countries are on the same relatively small island. The people of England and Scotland together are decidedly more homogeneous than the people in this vast country. The British have no Negro problem, for example. They have an Indian problem, to be sure, but not n the British Isles. Medical education in Great Britain is vastly different from that in the United States. The whole system of medical practice is different. The British still talk of nursing homes instead of private hospitals. Their nursing service is generally considered to be inadequate. Of course, I should hasten to say that the best of medical science and of medical practice in the British Isles is as good as that anywhere in the world, but the top-flight men are relatively few. In the United States, many of the rank and file of the profession are close to the top, which is certainly not the case in England.

Certainly at one time during the last thirty years the medical profession and the British Medical Association seemingly accepted the plan of compulsory health insurance; perhaps passive resignation to the act is more accurate phraseology. But more recently vigorous objection is being voiced. A Scottish physician entirely unconsciously illustrated some of the drawbacks and weaknesses of the act when he assured me that he liked the plan. The reason he gave was that after years of hard work the doctor had something that he could sell when and if he was minded to retire. Naturally, I asked him if a physician could turn over his panel patients in that fashion. Of course, said he, if one stood in well with the administrator, who ordinarily is not a doctor. I did not think it was appropriate to ask how one stood in well with the administrator, but did venture to ask about the application of the principle of freedom of choice on the part of the panel patients. He put me in my place emphatically and profanely for my visionary foolishness in regard to this, and in regard to my next query which concerned what would happen if the purchaser proved to be incompetent.

The Scottish physician was a man of some importance in his community and in the profession. His remarks were sadly substantiated by other physicians, who, as doctors are wont to do, retailed their own pet grievances. A common grievance was that the administrator was often arbitrary in refusing approval of expensive drugs. As we all know, some doctors prescribe preparations of drugs that are expensive when inexpensive preparations may be just as good or even identical. I got the impression, however, that there was a substantial reason for the grievance.

The big frogs in the medical puddle — that is, consultants on Harley and Wimpole streets in London and their prototypes in smaller centers — find that they derive a considerable consultation practice rather directly from this panel system. The panel physician sees the patients in his surgery, but if the patient desires or needs even a routine examination, too often he has to get it at his own expense from the consultant.

My best guess is that, by and large, the doctors in Great Britain benefit financially by this system. It is to be noted that the system was not inaugurated by the doctors. From it has developed what seems to be a sorry state of affairs for the patient and for medical standards of practice.

I have dwelt on the British experience with compulsory insurance because it is so much in the discussion, as well as because it shows clearly some of the fundamental difficulties in a nationwide plan. On the state level or lower, the same and additional difficulties have been discovered in this country. I believe that if the whole subject of compulsory insurance for sickness were better understood, possibly more profitable progress might be made. It

is painful to report that many doctors have little basic information on the topic. Too often some doctors express very emotionally their prejudices against what they regard as interference with the present system of medicine, which beyond doubt is the most effective in the world, but which is far from perfect and which can and should be improved, particularly so far as distribution of medical service is concerned. At times, the doctors are so vehement that they are charged with selfish interest. On the other hand, the average citizen thinks of his own selfish interest. He is, as a rule, interested mainly in good medical care, to be sure, but also at the lowest financial rate. The patient naturally wonders whether the insurance plan will not help his pocketbook. When the discussion becomes acute or acrimonious, the character of medical service gets lost. Thoughtful persons are properly much concerned over the quality of medical service. To me this is the nub of the whole matter, and I believe that this is the view of the substantial proportion of the medical profession. Changes will and must go on in the future. They have in the past. Anyone who thinks back, not thirty years but ten years, is acutely conscious of change. Certainly any doctor active in practice is aware of his own role in the change in medical practice. Otherwise, he would not be active in practice. I say this with the full conviction that the doctor is not sacrosanct and not even master of his own destiny. He is peculiarly a product and a creature of the community. The doctor does not want to dominate or dictate. He could not if he would. He is, however, the expert witness in the case. In the meantime, experimentation must and will continue. It is unthinkable that without careful study of the difficulties as actually encountered any revolutionary change will be adopted. Thinking is needed more than emotional slogans in which words do not mean what they ought to mean.

Personally, I am in favor of a broad, vigorous attack on poverty and want. Old age and unemployment must be faced and provision must be made for them. But mark you this, and to me the difference is vital, a pension is given to the elderly and a cash benefit to the unemployed, but in the case of illness in federal compulsory-insurance plans, medical service, not cash, is to be furnished through the government to the sick. Why this curious distinction, and why not keep separate, so far as possible, poverty and illness? And what if a government undertook not to supply cash to old age or for unemployment but to utilize the same principle as suggested for medical service? Would it be old age homes, or else, or particular jobs for the unemployed, or else? Is the question real or rhetorical, and why?

Poverty and want exist in the United States, even if they are not so horribly conspicuous as in Britain. And in no country does the attempted control of poverty and want include that social misfit so accurately described by Prime Minister Churchill as the "pub crawler." In America, he is the "barroom bum."

Since we have the Social Security Act in this country, I see no reason for the exemption of those employed in educational and religious institutions and in hospitals. My personal concern, as I have said before, is the quality of medical service, which must always be rising to higher and higher standards to ensure a healthy and happy people.

Certainly one must appreciate as an illustration the phenomenal growth of private insurance in the United States. There are now more than eighteen thousand industrial firms that are covered, with more than twenty million policyholders. They are covered, in most instances, with hospitalization, a $10 weekly disability allowance, $100 to $150 for surgical fees and an allowance for laboratory and x-ray charges. One medical society is arranging with an insurance company to cover everybody in the county in groups of five or more people.

Given reasonable opportunity, it seems likely that private insurance can do the job better in the United States than can the federal government.

Within the seemingly visible future, the war for freedom will be won. Paradoxically, to win this freedom we have had to sacrifice some of our own freedom. This we have done gladly and cheerfully for the cause. After the cessation of armed hostilities we shall have another freedom to win. We shall be tired; we shall be used to regimentation and to bureaucratic regulation of this and that. But I believe that we shall win back that freedom too. I believe that there is enough intelligence, enough imagination, enough initiative, enough resourcefulness and enough resolute determination to solve in our own American way these problems that I have discussed tonight. I believe that only dull and weary people turn their problems and troubles, with their freedom, over to others, which is in this case the government.

We may or may not like the lesson, but the glorious youth of this country has taught us of the older generation that too often what we thought was parental interest and solicitude was actually to their view paternalism, even if friendly, and at times a form of despotism even if benevolent in design. They want freedom, not paternalism or despotism, and we must give it to them, albeit with a prayer that they do not confuse license and liberty.

Once more I want to state with all the emphasis that I possess that this country needs better medicine. In improving medical service, the problems of better distribution must and will be solved. But let us not forget that we still need better doctors and better medical practice.

264 Beacon Street

THE McMURRAY OSTEOTOMY FOR NONUNITED HIP FRACTURES*

OTTO J. HERMANN, M.D.†

BOSTON

IN OCTOBER, 1939, I[1] reported on a small series of hip reconstructions done for painful, nonunited fractures of the femoral neck under the various prevalent standard procedures.These included the Colonna modification[2] of the Whitman method, the Magnuson modification[3] of the Brackett operation, direct bone graft and hip fusion.

On the whole, the percentage of good end results was discouraging, except, perhaps, for those obtained from the hip-fusion method. The temptation to adopt this procedure as the one of general choice was great, but I believed that it should not be done. After reading McMurray's[4] paper on fractures of the neck of the femur treated by oblique osteotomy, I was eager to try out his method on some painful nonunited hip fractures. At about that time, however, a discouraging talk with two surgeons from across the Atlantic on the ultimate (three-year) end results deflected me temporarily from going ahead with McMurray's osteotomy treatment. Some time later, after thinking over the reports of McMurray[4] and others of the high percentage of successful end results following such osteotomies, giving a high degree of painless hip function, which was nearly normal in many cases, I began doing the McMurray type of oblique osteotomy in a few selected cases of painful nonunited hip fractures. For two years the following McMurray technic, as described by me[1] in 1939, was used.

> The McMurray osteotomy . . . is a bifurcation operation based on the suggestion of Lorenz in which the shaft of the femur is transferred directly under the lower margin of the acetabulum and head of the femur. The chief purpose of this operation is to change a shearing force into a direct one. The following are the steps in this operation:
>
> A 15-cm. incision is made along the lateral side of the upper end of the femur in the trochanteric area. The fracture site is exposed so as to place the osteotomy line accurately. An oblique osteotomy is performed beginning on the outer side of the shaft, generally about the lower end of the greater trochanter and ending above the tip of the lesser trochanter. The upper end of the shaft of the femur is pried and shoved inward until the cut end is under the acetabulum and femoral head. This is followed by repair of the wound. A plaster-of-Paris fixation is used for a period long enough to ensure union at the site of the osteotomy. This fixation of the limb is in the neutral position in very slight abduction in order to prevent the development of knock-knee following removal of the plaster cast. Fixation is maintained generally three and a half to four months. The knee is kept in slight flexion so that the degree of rigidity is decreased.

In September, 1941, I[5] reported, besides other types, 8 nonunited hip fractures treated by McMurray's procedure. Six of them had progressed, as I thought, long enough to give a fair evaluation of their end results. At that time I wrote:

> Five of the 6 cases have gone clinically to good end results, and 1 patient, although not an absolute failure, still has to use crutches after six months. . . . In the few cases done by this method at our hospital the following data have been gathered: the patients have plaster-of-Paris spica fixation from eight to fourteen weeks, and hospitalization from ten to about seventeen weeks; they generally leave the hospital using crutches but soon thereafter omit them and use only a cane, with good clinical end results; they still use a cane in going upstairs, limp slightly, but have no local hip pain or tenderness on walking, sitting or lying down; the shortening varies from 2.2 to 2.6 cm.; there is a limited degree of internal, but a good degree of external rotation at the reconstructed hip, and also a good abduction and adduction range; there may be occasional stiffness; the patients can dress themselves in normal fashion, cross their knees and sit for protracted periods with ease and comfort. In short, a good 80 to 85 per cent return to normalcy is usually obtained. . . .
>
> At present the McMurray osteotomy seems adaptable to a greater variety of the painful ununited femoral-neck fractures than the other methods. The other points in its favor are its simplicity of execution, the production of less surgical shock and, lastly, the fairly high rate of good end results showing a very creditable percentage of return to normalcy.

Since the publication of this report, 11 more such reconstructions have been done at the Boston City Hospital by various surgeons. Two modifications in the technic were added. First, to place the osteotomy line more accurately a Kirschner wire is inserted in the proposed osteotomy line and its position is checked by x-ray, the wire then being used as a guide in doing the actual osteotomy. Second, in several cases the Blount blade plate has been used as a means of internal fixation after the osteotomy has been done. The first modification served to place the osteotomy much more accurately than the ordinary touch method, and the second was a definite improvement in that it was possible to do away with the prolonged plaster-of-Paris spica fixation and bed confinement, and it also prevented the cut end of the distal femoral shaft from slipping or sliding out.

Five of the 8 cases reported in 1941 have been reexamined. In all of them the 1941 end results had been deemed successful. Two patients have developed considerable pain, have lost some of their local hip-motion range, and show an increase in shortening because of some change in position of the distal femoral shaft due to lack of real bony union. Thus, the 1941 rating of the McMurray osteotomy has had to be revised downward.

Of the last 11 patients treated, 2 died soon after the operation, one three days afterward from cerebral thrombosis, and the other within twenty-four hours from cardiac failure. These 11 cases have been summarized as follows:

CASE 1. L. S., a 51-year-old woman, received on June 23, 1943, a McMurray osteotomy for a painful nonunited fracture of the right femoral neck in which the preliminary

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Kirschner-wire technic was adopted. A plaster-of-Paris spica fixation was used, with the leg in 20° abduction and in the neutral position, until September 24. The patient was discharged on October 3 on crutches. She discarded them on October 10 and used a cane until December 25. She now limps somewhat but can do her daily routine walking. She can sit with complete comfort for several hours, although the leg stiffens temporarily after 1½ hours of sitting. There is some soreness of the hip at night and during inclement weather. She can go up and down stairs one step at a time using a cane. A recent physical examination revealed a 3-cm. shortening of the right leg. The internal rotation was practically nil and the external rotation 20°. Adduction was limited to 15°, and abduction to 25°. The quadriceps muscle group showed some atrophy. The patient had some difficulty in putting on her stocking and shoe.

Comment. This case does not show an 80 or 85 per cent return to normalcy, but the patient has an almost painlessly functioning hip and can do her routine daily walking and sitting, neither of which was possible before the osteotomy.

Case 2. J. DeL., a 51-year-old man, received on March 3, 1943, a McMurray oblique osteotomy followed by a Blount internal blade-plate fixation. He left the hospital on crutches on April 6, and the crutches were discarded in July. Since then the patient has used a cane or one crutch. He was non-co-operative, and it was difficult to convince him that daily routine leg exercises and walking were important to his progress. He now does more walking but has recurring pain in the hip when tired. He can, however, sit with comfort and can put on his sock and shoe without much difficulty. The leg presents a 3-cm. shortening with only slight internal rotation. Adduction is limited to 15° and abduction to 30°. Flexion at the thigh is 35°. The patient goes up and down stairs with the aid of the railing or a cane.

Comment. This patient can at least walk and sit with a fair degree of comfort and can dress himself, neither of which was possible previous to the osteotomy. Although there is recurring pain on tiring after long walks, it ceases after a short rest and is thus not so severe and persistent as before the operation.

Case 3. E. C., a 76-year-old woman, received on September 23, 1942, a McMurray osteotomy for a painful, non-functioning, nonunited fracture of the right hip. A plaster-of-Paris spica fixation was used for 3 months. The patient was discharged on January 8, 1943, using crutches with active weight bearing. She discarded one crutch on February 1, used the other for another month, and has since been using a cane. She had complete relief of pain for 5 months following the operation, but at present has some pain in the hip and knee, which is relieved by acetylsalicylic acid. She does her normal amount of daily walking, goes to the motion pictures and sits for several hours with comfort, does her daily housework and can easily put on her shoe and stocking. She does, however, limp somewhat and still uses a cane. The right leg shows a 3-cm. shortening. There is limited internal rotation at the right hip but 40° of external rotation. Adduction is limited to 15° and abduction to 25°. There is 15° flexion deformity. The patient walks with the right leg in some degree of external rotation.

Comment. This can be considered a fair end result only in that the patient can walk, sit and dress herself with a fair degree of ease and do her daily housework, none of which could be done before the operation.

Case 4. M. M., a 50-year-old woman, received a McMurray osteotomy on May 20, 1942. A plaster-of-Paris spica was applied for 13 weeks. The patient was discharged on August 17 on crutches, used them until July, 1943, then discarding them for a cane. At present she is doing a moderate amount of walking. She returned to her work as a telephone operator in the summer of 1943. She can sit with comfort. The only pain she has in her hip is of moderate degree and appears — strangely enough — on arising in the morning. The leg presents a 2.5-cm. shortening. Adduction is limited to 20° and abduction to 25°. There is internal rotation of only a few degrees, but external rotation of 45°. There is a flexion deformity of 15°, with further flexion to 90°.

Comment. This patient progressed slowly — owing to her apprehensive attitude — to a reasonably good end result. She walks well with the aid of a cane, and can sit with ease for protracted periods, as her work attests. She still has difficulty in putting on her shoe and stocking. She could not walk or sit with comfort previous to the operation.

Case 5. E. W., a 62-year-old woman, received a McMurray oblique osteotomy for painful nonunion of a fracture of the left hip on October 23, 1942. A plaster-of-Paris spica was applied. This operation was done under intravenous Pentothal Sodium anesthesia. The patient showed no unfavorable immediate postoperative reaction, but 3 days later died from cerebral thrombosis.

Case 6. N. J., a 65-year-old woman, received a McMurray osteotomy on February 12, 1942, after having been treated medically for arteriosclerotic disease. She was considered a fair risk for the osteotomy, but died 24 hours postoperatively from cardiac failure.

Comment. Although the patient in Case 5 appeared to be an excellent operative risk, Case 6 was of the borderline type, preoperative medication being necessary for over a month. It would probably have been better judgment to let this patient remain a wheel-chair invalid.

Case 7. J. P., a 62-year-old man, received a McMurray osteotomy for the left femur on February 20, 1942. A plaster-of-Paris spica fixation was used for 3 months. The patient was discharged on June 1, using crutches. He is now up and about using a cane. He can walk with comfort, has no hip pain and gets about much better than before. He cannot cross the left knee over the right, but he can put on his sock and shoe. He can go up and down stairs using the banister and a cane. The leg presents a 3-cm. shortening. There is practically no internal rotation at the hip, but there is external rotation of 25°. Adduction is limited to 20° and abduction to 25°. There is a 10° flexion deformity, with further flexion to 70°.

Case 8. J. McG., a 69-year-old man, received on November 11, 1941, a McMurray osteotomy for a nonunited fracture of the left femoral neck, performed by the preliminary Kirschner-wire technic. A plaster-of-Paris spica fixation was applied until January 16, 1942. Because of some stiffness of the left knee, he was put on balanced traction. On February 11, he started using crutches, and 1 week later he was discharged on crutches. He gave them up in March, 1942, and used a cane, which he still uses when walking out-of-doors. He can walk and sit with comfort, although prolonged sitting causes some local stiffness but no pain in the hip. There is occasional pain in the knee, and he limps when walking. This has now been greatly decreased by inserting a lift in the shoe. There is a 3-cm. shortening of the leg, a few degrees of internal rotation — under 5° — 35° of external rotation, 25° adduction, and 30° abduction. There is some quadriceps atrophy.

Comment. This patient not only had a painful hip condition before November, 1941, but also had a bothersome left knee that became quite stiff following the spica fixation. This knee still gives him some bother on prolonged sitting or after long walks. The hip is comfortable considering the degree of motion and amount of shortening. This result cannot be considered a return to 80 per cent normalcy, but the patient has a serviceable, painlessly functioning hip.

Case 9. V.S., a 72-year-old man, received on September 17, 1943, a McMurray osteotomy for a painful nonunited fracture of the left femur, which was followed by a Blount blade-plate fixation. The patient suffered severe postoperative shock and had to have plasma and later two blood transfusions. An adductor tenotomy was done on October 1. The patient was discharged on December 9, using crutches. He gave up the crutches for a cane in January, 1944. He does not take long walks but when walking has no hip pain. He tires easily but can sit for protracted periods without pain. He can put on his sock and shoe easily. The leg presents 2.5-cm. shortening. There are a few degrees of internal rotation, and 35° of external rotation. Adduction is limited to 15° and abduction to 25°. There is no hip pain on the push-and-pull test.

Comment. This patient has attained a painlessly functioning hip, can walk and sit and dress himself with comfort and

has no hip pain. He is gaining strength and can take longer and longer walks.

CASE 10. J. F., a 66-year-old man, received on September 14, 1943, a McMurray osteotomy, followed by a Blount blade-plate fixation. He sat up on September 29 and walked on crutches on October 10. He was discharged on October 23 using crutches. He is still using crutches although he has some pain on protracted sitting or walking. Extreme cold gives him some local discomfort. He has done none of the daily prescribed simple exercises and cannot be persuaded to discard his crutches for a cane. He cannot put on his sock and shoe. The leg presents considerable disuse atrophy. There is practically no degree of internal rotation at the hip. The external rotation is 25°. Adduction is limited to 10°, and abduction to 30°. There is a flexion deformity of 15°. There is some pain in the hip on the push-and-pull test and on any attempt at forced rotation.

Comment. This patient, although walking for short distances, is still using crutches. He can sit with comfort for a short while but finds that long sitting causes hip pain. He also cannot dress himself. This is not a good end result.

CASE 11. J. R., a 64-year-old woman, received a McMurray osteotomy on July 10, 1942, followed by spica cast fixation until September 10. On its removal, the left-knee flexion was 30°. She walked with crutches until January, 1943, and then used a cane. At present, she uses a cane occasionally and wears a 2-cm. lift in her shoe. She has no hip pain. She did have some pain in the knee and hip on getting out of the spica, but persistent local physical therapy in the form of massage, exercises and heat, limbered up the leg so that by January, 1943, she was walking with comfort using a cane. She now does her own housework and her normal daily walking, sits with comfort, can cross her knees and dress herself and can go up and down stairs one step at a time. The leg presents a 3-cm. shortening. Abduction is limited to 25°, and adduction to 15°. There is practically no internal rotation but a good degree of external rotation. On the push-and-pull test there is no "give" or pain in the hip.

Comment. This patient finally had an excellent end result after a discouraging immediate postoperative convalescence, due chiefly to her knee.

From this series and the previously reported one, the following composite data have been gathered.

The preliminary Kirschner-wire insertion through the proposed osteotomy site, together with an immediate x-ray checkup as a guide for the osteotomy, is extremely valuable, even though it consumes an extra five minutes. It serves to place the osteotomy more accurately than does the sight-and-touch method.

From the cases treated postoperatively by the plaster-of-Paris spica fixation the following points are deduced: Despite the apparent simplicity and shortness of the operation itself, the high mortality figure shows clearly that a good deal of shock is entailed and that the patients must be chosen as carefully as for the other, more surgically devastating, reconstruction procedures. The cases chosen are those deemed good surgical risks by both the surgeon and the internist. These patients must be given good supportive treatment before and after the operation, especially those in spica fixation, who require a bed-rest period of eight to fourteen weeks, with a few more additional weeks of hospitalization. These patients as a rule leave the hospital on crutches and discard them in periods varying from a week to a year, depending on the local condition and the co-operation of the patient. Those who come to a good clinical end result following this method — one can expect about 80 per cent to do so — walk with a slight limp owing to the resultant shortening of 2 to 3 cm. They do their daily amount of routine walking and go up and down stairs without pain but using a cane. Some have moderate pain at the end of a day after an extra-long walk. They can sit and lie with comfort, although in some cases there is a feeling of local stiffness on getting up after a protracted sitting, which, however, passes off on moving about. They can as a rule put on the stocking and shoe on the affected leg because they can flex the hip and cross the knees and adduct and externally rotate the leg. It is true that the crossing of the legs is often done with some difficulty, but there is no pain. The patients can brace themselves on their legs quite well because of the presence of an average of 25 to 35° of abduction. From a local anatomic standpoint the picture is not encouraging, and all that can be said is that the former shearing force of the femur has been transposed into a direct force that eliminates pain and gives sufficient stability and mobility at the hip joint to enable the patient to go about in a good degree of functioning comfort with the aid of a cane.

The several cases in which the Blount blade-plate internal fixation was used following the osteotomy furnished additional data. The technical part of the fixation could be made much simpler and the plate made to conform more accurately to the angular shape needed if a two-piece combination, such as the Thornton plate together with the Smith-Petersen nail, was used. This fixation does away with postoperative spica fixation and thereby allows much earlier mobility of the various joints involved in the spica fixation and, of course, much earlier application of local physical therapy. It shortens the bed-confinement period by five to eleven weeks. The final advantage of this fixation is that it prevents the slipping or sliding of the transposed femoral shaft from its moorings.

SUMMARY AND CONCLUSIONS

The McMurray osteotomy is not so simple and nonshock-producing as originally thought.

The cases chosen for the operation should be selected carefully from a local and general standpoint. There must be a fairly viable head and some femoral neck, and the patient must be a good surgical risk.

The patients should receive definite well-guided preoperative and postoperative physical therapy and general supportive medication and nutrition as outlined by the medical consultant. As the postoperative period goes into the third year or more, there may be a return of hip pain, owing to local changes in position or to bony changes. A good end result by this method gives a painlessly functioning hip, enabling the patient to sit, walk and dress with comfort. This means a great deal to a patient who

previous to the operation was having persistent local hip pain and was confined to a bed or wheel chair or compelled to use crutches. The McMurray operation, although apparently more generally adaptable than other methods, for the reconstruction of painful nonunited hips and of easier execution, and probably giving a higher percentage of painlessly functioning hips, should not be universally used in such cases. Now, as always, the surgeon experienced in such procedures should choose the one he considers best adapted to the case in hand.

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VAGINAL BLEEDING FROM POTASSIUM PERMANGANATE AS AN ABORTIFACIENT

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BURNS of the vagina and cervix due to the use of potassium permanganate tablets as an abortifacient constitute a new and gradually increasing serious complication of early pregnancy in and around Boston. Since March, 1936, when this diagnosis was first made at the Boston City Hospital, 65 cases have been treated by the Gynecological Service. Inasmuch as this entity has been so infrequently mentioned in the literature, it is the purpose of this paper to present its important features and the report of a case with serious sequelae.

A review of the literature reveals that there has been only one article written in English on this subject.[1] Between 1932 and 1940 twelve articles were written in Italian and Spanish on the use of potassium permanganate solution as a vaginal medicant.[2-13] These papers mention the use of potassium permanganate tablets as an abortifacient.

A review of the records of the Gynecological Service shows that from 1936, when 3 cases were admitted, to the present there has been a gradual increase in the number of admissions for this type of case, 20 cases having been admitted in 1943. From January 1, 1930, to January 1, 1944, 15,976 cases of all types were admitted to this service. There were 65 patients with potassium permanganate burns of the vagina or cervix, representing 0.4 per cent of all admissions. During the years 1941 to 1943 these cases comprised 5 per cent of the patients admitted with threatened miscarriages.

The ages of these 65 patients varied from eighteen to thirty-eight years. There were 36 patients in the third decade, 19 in the fourth, and 9 in the second. Of the 53 patients who were multiparas, 38 had been delivered of living babies within the year previous to the date of admission to the hospital, and they all offered this as the reason for attempting to produce an abortion.

Forty-two of the patients had missed only one monthly period. The duration of the amenorrhea in the remaining cases was as follows: two months, 14 cases; three months, 5 cases; four months, 2 cases; and five and six months, 1 case each.

No patient was ever sent to this service with the diagnosis already made. The diagnosis of the admitting physician was usually threatened miscarriage. Each patient gave a history of some menstrual irregularity, but finally admitted having inserted a "tablet" to bring on an overdue menstrual period. The usual history was that of spontaneous, painless bleeding. Eighteen patients complained of irregular bleeding for several months. The histories as given by the patients suggested all the various causes of vaginal bleeding that might be found in this age group.

Questioning concerning artificial induction of bleeding in all cases of vaginal hemorrhage is a routine matter at the time of admission, and it was only in replying to this query that 22 patients admitted using potassium permanganate. The other 43 denied the use of any method of induction, and it was only after vaginal examination and detection of the lesion that they admitted using this chemical as an abortifacient.

The onset of bleeding usually occurred within two hours of the time that the tablet was inserted.

The diagnosis is indicated by profuse bright-red bleeding, with persistence of fresh bleeding after removal of the vaginal clots. In most cases the irregularity caused by the chemical burn can be felt on the cervix or on the vaginal mucosa. Speculum examination, which is not a routine procedure in the examination of patients with threatened miscarriage on this service, reveals one or more eroded areas covered by a black eschar that are usually found in the posterior fornix on both the cervix and the vaginal mucosa. When this lesion is found on the cervix without an eschar, it resembles a severe cervical erosion or carcinomatous crater. The bleeding varies from a slow ooze to a bright-red arterial pulsating flow.

In 4 cases in which a speculum examination did not seem indicated, a diagnosis of incomplete mis-

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carriage was made because of the seemingly open cervical os and the misleading history of having passed fetal tissue. These patients were prepared for dilatation and curettage, and it was only after the cervix was exposed under general anesthesia that the correct diagnosis was made.

A diagnosis of pregnancy based on physical findings was made in 40 cases. In the remaining cases either the patient was not pregnant or there was not sufficient evidence to make the diagnosis.

In 10 cases it was necessary to treat the patient in the operating room, where, under general anesthesia, one to three mattress sutures were placed about the bleeding points. Thirty-four cases were treated by firmly packing the vagina for forty-eight hours. Twelve cases required rigid shock treatment, including several transfusions.

Only 6 patients were successful in producing an abortion, as evidenced by the recovery of fetal tissue. One of these patients returned when her menstrual period was overdue for a second time and admitted that she had inserted two tablets of potassium permanganate on the previous day.

The average hospital stay was five days. There were no deaths. There was no evidence of generalized toxic symptoms as the result of absorption of this chemical.

Case Report

S.R., a 34-year-old tripara, was admitted with a chief complaint of vaginal bleeding. Her last menstrual period had occurred on May 11. She stated that for 6 weeks she had had slight staining, using a pad a day. She was well on going to bed the night before admission, but after having intercourse began to bleed profusely. She felt weak and fainted and was brought to the hospital in shock. She denied induction. The blood pressure was 70/30, the pulse 140, and the respirations 25.

There had been two full-term normal deliveries and one miscarriage. The last pregnancy occurred 12 months previously, and terminated in a miscarriage in the 3rd month.

Vaginal examination showed parous introitus and large blood clots in the vagina. The cervix was soft. The cervical os was closed. The uterus was the size of a 4-month pregnancy. The vaults were free. There was an irregularity of the posterior lip of cervix, extending into the vagina. Speculum examination revealed a moderate amount of blood in the vagina. On removal of the clot there was bright-red bleeding from a crater the size of a half dollar on the posterior lip of the cervix and extending into the posterior fornix.

The patient was brought to the operating room, and under nitrous oxide and oxygen anesthesia three mattress sutures were placed in the posterior lip of the cervix and a firm pack was placed in the vagina and left in place for 48 hours. The patient was transfused and treated for shock for several hours, with eventual recovery. She was discharged on the 7th hospital day.

The patient was followed in the Prenatal Clinic throughout the ensuing months of her pregnancy. It was noted that the cervix was gradually becoming distorted as a result of a cicatrix. The cervix pointed posteriorly and was continuous with the cicatricial mass, which replaced the posterior fornix. Since the cervix was hard, and since the os was only a little larger than a pinpoint, a cesarean section was done at term.

Owing to the gradually increasing frequency of this relatively new entity, physicians, particularly those practicing in and about Boston, should consider it in a differential diagnosis of all cases of vaginal bleeding in the childbearing age. It is doubly important when one considers that in all these 65 cases not one patient gave an accurate history. As a result of the wrong diagnosis these cases may be improperly treated as threatened miscarriages and pregnancies may be unnecessarily interrupted.

There may be some significance in the fact that the first appearance of this entity in the foreign literature occurred shortly before the first case was seen at the Boston City Hospital. The patients were extremely reluctant to give the source of their fallacious information, and were surprised when they were told that potassium permanganate was not an abortifacient. It seems that an attempt should be made to educate the laity about this fallacy before use of the drug becomes more widespread.

Summary

A series of 65 cases of vaginal bleeding following the use of potassium permanganate as an abortifacient is presented, and a typical case is reported.

The importance of this drug as a cause of vaginal bleeding during early pregnancy and the dangers of improper treatment based on an incorrect diagnosis are emphasized.

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MEDICAL PROGRESS

PHYSICAL MEDICINE IN REHABILITATION

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REHABILITATION has been defined as the planned attempt through the use of all recognized measures under skilled direction to restore those persons who, because of disabilities, do not assume to the greatest possible extent and at the earliest possible time that place in the productive system of society that they are potentially capable of assuming.[1] Physical medicine, which includes physical and occupational therapy, is an important adjunct to ordinary medical and surgical treatment in rehabilitation, particularly in wartime. Krusen[2] has reported that in civilian practice 5 to 10 per cent of all patients require some form of physical treatment. At the Mayo Clinic 8.3 per cent of all the patients who registered in 1939 were treated in the Section on Physical Medicine. In 1942 the proportion increased to 9.5 per cent. In military practice the percentage of patients who require physical rehabilitation is considerably greater. In several army hospitals 20 to 30 per cent of all patients are referred for physical therapy. As further evidence of the magnitude of these problems, it has been estimated that in 1942 there were 4,000,000 persons in the United States who suffered from physical impairment and that the annual increment was 800,000.[3] Two hundred and sixty thousand of these were said to need some type of rehabilitation and 50,000 were in the process.

An over-all view of rehabilitation in various types of disorders is shown in a table in the appendix to the Tomlinson[4] report, which was reprinted in a paper by Krusen.[5] By referring to this table it can be seen that physical and occupational therapy have a large role in any rehabilitation scheme.

Rehabilitation is a popular topic, and many papers have been written recently on the sociologic, economic and medical aspects of the subject. One of the first books to appear was a symposium entitled *Rehabilitation of the War Injured*, edited by Doherty and Runes.[6] Here can be found authoritative articles by an impressive group of experts giving short summaries of procedures and methods that are of value. Medical, surgical, psychiatric and physical methods of treatment are described, with their application in cases of injuries to the central nervous system and in those involving reconstructive and plastic surgery and orthopedics. A book by Davis[7] is a valuable guide to treatment of neuropsychiatric disorders and is based on the author's wide experience in the Veterans' Administration Facility. Hudson and Fish's[8] *Occupational Therapy in the Treatment of the Tuberculous Patient* is recommended to physicians interested in this field, although it is primarily written for students of occupational therapy. The more technical aspects of physical therapy, particularly mechanotherapy, are described in detail by Smith[9] in *Rehabilitation, Reeducation and Remedial Exercise*. A short manual by various authors entitled *After-Care and Rehabilitation*, edited by Rolleston and Moncrieff,[10] also gives detailed information on physical-medicine procedures. Three new books have appeared, *Physical Medicine in General Practice*, by Bierman,[11] *Technic of Electrotherapy*, by Osborne and Holmquest,[12] and *Manual of Physical Medicine* by Kovacs.[13] Especially recommended are the manuals on physical therapy and occupational therapy available in reprint form through the American Medical Association, which may serve as practical guides to physicians in the armed services.

PHYSICAL MEDICINE FOR TRAUMATIC CONDITIONS

In military practice the lesions most frequently benefited by physical medicine are traumatic in origin. Krusen[2] has divided these into two large groups — trauma of bones and joints, including fractures, dislocations, stiff joints, bone grafts and traumatic arthritis, and trauma of soft tissues, including scars (particularly of amputation stumps), contusions and lacerations of muscles and tendons, postural strains (particularly backache and flatfoot), paralysis (especially as a result of peripheral nerve injuries) and tendon transplantations.

Although no striking changes in technic have recently been developed, appreciation of the benefits to be derived from physical therapy in traumatic conditions is not yet widely disseminated throughout the medical profession as a whole. In summarizing the principles of physical medicine as described by Pemberton,[14] it can be stated that the central agencies of physical therapy consist of heat, massage, rest and exercise. Exposure to heat is accompanied by a rise in body temperature, an increase in the heart rate and peripheral vasodilatation. A great increase in rate of circulation occurs throughout the body, with leukocyte diapedesis into neighboring tissue, and hence phagocytosis and other influences on fixed tissues. Total metabolic activity is increased and the lymph flow is accelerated. The use of heat locally and sometimes systemically paves the way for massage.

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About 25 per cent of the blood of the body is in the capillary beds, many of which are near the surface or at the periphery. Stroking of capillary beds induces changes in the caliber of the capillary vessels, an acceleration in the rate of blood flow through them, a rise in the peripheral blood-cell count and a migration of leukocytes. Some cellular and acinous contents of certain organs can be expressed or changed in distribution. There is no production of lactic acid following massage, such as accompanies voluntary use of muscle, or of alkalosis, such as follows exposure to heat. Extravasations of blood or débris into tissue from trauma can be removed by massage more quickly than would otherwise occur. Improper use of massage, may, of course, draw blood away from regions greatly needing it and so lead to fatigue and depletion. Exercise, which affords the only means of developing muscle, has some of the effects on capillary beds produced by heat and massage. So-called "postural exercise," involving deep breathing and achievement and maintenance of better posture in recumbency, goes far to compensate for loss of bodily activity and has great value for persons confined to bed or a sedentary life. Rest is also important in physical therapy. Pemberton also states that there is probably no other field of medicine in which early and full grasp of the principles at stake would have equally significant results in returning soldiers to duty and in reducing invalidism. Some of the ordinary applications of physical therapy in traumatic surgery will be described in more detail.

Fractures

Successful treatment of fractures is not based solely on securing bony union but also on the rapidity with which full working function is obtained. The type of aftercare of fractures may influence considerably the functional result, particularly the speed of recovery.[15] The proper aftercare of a fracture consists of maintenance of fixation until union has occurred, early restoration of efficient circulation, development or preservation of muscular tonus and power and guidance in obtaining normal co-ordinated skillful joint motion. The purposes of physical therapy have been outlined as follows:

> Promoting the early absorption of hemorrhage and traumatic exudate; relaxation of muscle spasm to relieve pain and discomfort; re-establishment of normal circulatory conditions in the affected extremity, blood stream and lymphatics, which ensures a more rapid and complete healing of the fracture; and building up in the muscles of the extremity that tone and flexibility so necessary to normal use. These effects are brought about by physical agents acting on the neuromuscular and neurovascular reflex mechanisms and through stimulation of muscles by physical means or voluntary action.[16]

To accomplish these purposes the following physical agents are used: heat, massage, muscular stimulation and occupational therapy. Heat may be applied in the form of radiant-heat lamps, whirlpool baths, hot packs or diathermy, preferably of low intensity and sustained duration. Massage consists of light stroking alone in the early stages and deeper stroking later, it being borne in mind that the beneficial effects are obtained more by reflex stimulation than mechanical force. Under muscular stimulation, contractions are obtained preferably by inciting voluntary efforts, either within a guided range of motion or by stationary contractions, such as so-called "setting exercises." In some cases, particularly those in which prolonged immobilization is necessary, electrical stimulation with a tetanizing current (sinusoidal or faradic) is a valuable aid in preventing muscle atrophy and fibrosis and in improving circulation. When a proper degree of firm union is obtained, the patient must be instructed and encouraged in graded active and functional use of the affected parts. Occupational therapy emphasizes the value of functional, properly graded activities as incentives to the development of strength and skill and as a means of overcoming psychologic handicaps to recovery.

Sprains and Dislocations

Cold rather than heat, compression bandages and elevation are recommended for the immediate treatment of sprains. Later the measures described for aftercare of fractures are suitable, with proper grading of exercises an essential feature. When joints have become stiff from traumatic arthritis, chronic bursitis or other cause, too much must not be expected of heat and massage. Return of function is dependent on proper stretching by active and assisted exercises. At times this may be supplemented by splinting and traction.

Scar Contractures

Limitation of motion secondary to contracture of scar tissue after burns or other soft-tissue injuries may require prolonged physical therapy. In case of hand involvement specially designed splints allowing motion have been described.[17, 18] Mild heat in the form of a whirlpool bath or paraffin bath has been recommended, as well as a special type of massage to improve circulation and loosen adhesions, followed by active exercises and graded functional activity as prescribed in occupational therapy.[19]

Amputations

In preparing stumps for early use, heat, massage and exercises are helpful.[20] Moderate radiant heat may be used to stimulate circulation, and also whirlpool baths, with avoidance of excessive use and softening of the skin. Massage also aids in promoting circulation. Of special importance is a program of exercises to develop the strength of the musculature. These are graded to include resistive exercises four times daily. Physical therapists should also instruct patients in the mechanics of using an

artificial limb and walking with walkers, crutches and canes.

Peripheral-Nerve Injuries

Physical therapy in injuries to the peripheral nerves includes the use of proper splinting to prevent overstretching of paralyzed muscles by gravity or antagonistic strong muscles.[21] This should not be constant, since severe joint contractures may thus develop. In cases of paralysis splints should be removed for heat and massage to improve circulation and for passive exercise to prevent joint stiffness. Recent studies have indicated that adequate stimulation with low-frequency interrupted direct or alternating currents is useful in lessening atrophy, preventing fibrosis and hastening return of function with reinnervation.[22, 23] Quantitative electrical tests familiar to the specialist in physical medicine are also of aid in evaluating the extent of neural damage and in following the progress of regeneration.[24, 25]

Spinal-Cord Injuries

The treatment of injuries to the cervical, thoracic and lumbosacral cord has been adequately described in recent reports by Munro.[26, 27] The usual physical therapeutic measures useful in spastic paralysis are employed.[28] The frequent finding of atrophic stiff hands in the cervical injuries was noted by Munro, who suggested that it might be due in part to vitamin deficiency. He recommends giving intensive treatment with vitamin B complex, in addition to early and continuous physical therapy.

Health Resorts

British physicians have found that health resorts are invaluable as centers for those disabled in war. In the United States, also, rehabilitation centers have been set up in such localities. The United States Army Medical Corps, for example, has established them at White Sulphur Springs, West Virginia, Colorado Springs and Denver, Colorado, Hot Springs, Arkansas, Battle Creek, Michigan, Swannanoa (near Asheville), North Carolina, Tucson, Arizona, and Miami, Florida. The Bureau of Medicine and Surgery of the United States Navy has established hospitals at Asheville, North Carolina, Yosemite, California, Glenwood Springs, Colorado, and Sun Valley, Idaho. The Veterans Administration, it is said, is contemplating the establishment of hospitals at such health resorts as Saratoga Springs, New York, Hot Springs, Utah, Hot Springs, South Dakota, Bay Pines, Florida, and Mineral Springs, Texas.

The exact sphere of usefulness of treatment in a health resort as part of a broad plan of total rehabilitation has been shown by Krusen.[5] He outlines the steps in a complete plan for total rehabilitation as follows: immediate emergency care, secondary emergency care, care during transportation, general hospital care, care in rehabilitation centers, vocational guidance, vocational training, selective placement and industrial rehabilitation. He states that health resorts will be utilized most frequently as rehabilitation centers, with vocational guidance and vocational training included. In some instances health resorts can fit into general hospital care, the hospital being located at the resort. Selective placement can occasionally be arranged at the health resort before establishing a permanent home in civil life.

In order that American physicians may have more accurate knowledge about spa therapy and its range of usefulness, a series of articles have been published by distinguished specialists in the field under the auspices of the Committee on Health Resorts of the American Medical Association. In these papers are discussed the effects of climate on disease[29, 30] the role of rest, exercise and diet,[31] underwater therapy,[32] the biologic action of trace elements[33] and the nature of natural therapeutic agents, such as mineral waters and peloids.[34] Articles are also devoted to the physical equipment,[35, 36] types of treatment available,[37, 38] administration[39] and economic aspects.[40] The subject of hydrology and spa therapy is in fact deemed so important that plans have been made to establish a research center in physical medicine, with emphasis on acquiring more fundamental knowledge relative to this type of therapy.[41]

Convalescent Reconditioning

An aspect of rehabilitation that is receiving special attention in the armed services is that of planned convalescent care. Thorndike[42] has stated:

> The Surgeon General's reconditioning program is divided into four main phases: physical, educational, occupational and recreational. The physical portion of the program is designed to allay the deteriorated factors coincident with recumbency in bed by use of special bed exercises designed to maintain body tone and vigor and, when indicated, is often focused to strengthen a particular portion of the body. As the patient's strength increases and he becomes ambulant, these exercises are gradually increased in tempo and dosage and are supplemented by various types of athletic games and recreational sports. Physical therapy, when indicated, is co-ordinated with this regimen. Occupational therapy is an important part of the treatment of many patients. It is used both as a functional and a diversional type of therapy. Efforts are made to integrate closely the educational activities with the occupational therapy in order to double the effect of each. Co-ordination of occupational therapy with physical therapy is being effected with good results.

Huddleston[43] has reported the effective use of a convalescent ward at the Fitzsimons General Hospital. Drewyer[44] and Lowman[45] have described similar arrangements in the Navy. Special programs have been outlined for psychiatric casualties.[46] The methods in use in the Army Air Forces have been especially efficient.[47]

Civilian hospitals will do well to incorporate applicable portions of these plans for convalescent care, both to ease demand of beds by speedy convalescence and for the welfare of the patient. The need for research in this field is made apparent by a series of papers indicating the ill effects of complete bed rest.[47-52] Hansson[53] has shown how physical therapy may be utilized to counteract the bad effects of rest and to "turn out a discharged patient with adequate circulation, better muscular tone, better posture, a normal functioning gastrointestinal tract, better skin and a mind that is mentally alert instead of depressed."

A closely related subject is that of the physical fitness of so-called "normal" persons. Its importance is indicated from the finding that one out of four of the teen-age registrants fails to pass the Selective Service examination. Studies have been made in determining methods to evaluate physical fitness and to quantitate the effects of training.[54] Already plans have been made to establish a national program for physical fitness.[55]

Industrial Rehabilitation

Industrial concerns and insurance companies are beginning to realize the importance of medical care that goes beyond hospital medicine and surgery and includes convalescent care and industrial rehabilitation. Howitt[56] has described a center in England constructed on the lines adopted for army practice. Aitken,[57] Coulter,[58] Zeiter[59] and others[60, 61] have reported similar setups established in this country. Both physical and occupational therapy are extensively employed, particularly in the early stages after injury. Activities are later directed toward vocational guidance and placement in jobs appropriate for the degree of handicap. The program of the Caterpillar Tractor Company, including job analysis and the use of 800 handicapped employees, is an outstanding example of success in rehabilitation.[62]

* * *

The wide scope of physical rehabilitation and its importance in wartime are now apparent. One of the most serious needs is trained personnel for convalescent centers. Teachers are also needed to instruct a new group of specialists in this field. Already teaching and research centers in physical medicine have been established for this purpose in a number of leading university medical centers. The old term "physical therapy" has now been largely replaced and a new specialty, "physical medicine," is being established. A comprehensive and enlarged view of physical medicine in rehabilitation can be gained from the following quotation:

> It seems that there are two definite phases: first, physical medicine as it pertains to definitive treatment and how it can be utilized by the physician in the diagnosis and treatment of disease; secondly, — and which I think is the more or less new concept as far as the general medical profession is concerned, — its utilization in the broad field, taking up the dead space between definitive care and ability to return to productive work, the setup for retraining and reconditioning, medicine and its relation to environment, occupation, social status and so forth. It is going to take physicians with real training and background to meet this special need; it should be the broadest of all medical specialties, utilizing as a basis for physical medicine the great potentialities of oneself. This would be more or less the science of how to use these potentialities and the art of such application.[63]

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

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CASE 31071

PRESENTATION OF CASE

A four-and-a-half-month-old infant was admitted to the hospital because of opisthotonos and failure to gain weight.

The infant was born six weeks prematurely after a normal labor of five and a half hours. The pregnancy was complicated by toxemic symptoms. The birth weight was 5½ pounds. After three and a half weeks in an incubator the child was discharged home, but was a poor feeder and gained weight very slowly, the weight on admission to this hospital being only 8¼ pounds. The mother noted that the child cried a great deal and often turned blue after a crying spell. The child also tended to lie in an opisthotonic position, with the back arched and the head held well back, especially when crying. He could support his head. There was no history of jaundice or convulsions. On several occasions the child had had a running nose but had never been febrile.

Physical examination revealed a spastic, irritable child, often opisthotonic and crying almost constantly; there was a click-clack sound to the breathing after the crying ceased. There was slight cyanosis of the face, especially about the mouth and most marked during crying spells. The skin was clear. The muscles appeared unusually well developed. The head was malformed, with a definite bulge over the occipital region. There was considerable exophthalmos, estimated at about 4 mm. The pupils reacted normally, and the fundi were negative. The ears were negative. There was questionable enlargement of the lateral lobes of the thyroid gland, and a thrill and bruit were noted over this area; the bruit could also be heard in the lower temporal regions. The lungs were clear. Examination of the heart revealed the point of maximum impulse to lie just below and beyond the nipple line. The rate was rapid and regular. A systolic murmur was heard all over the precordium, loudest in the fourth and fifth intercostal spaces, just lateral to the left sternal border; it was transmitted to the neck and back, shifting somewhat with change in position. The pulmonic second sound was greater than the aortic, but both were prominent. The liver was felt three fingerbreadths below the costal margin, and the spleen was palpable. All the extremities were spastic, the legs more so than the arms. The deep tendon reflexes, especially those of the lower extremities, were exaggerated. The Babinski, Oppenheim and Gordon signs were positive bilaterally. The abdominal reflexes were absent, but other superficial reflexes were normal.

The temperature was 100°F., the pulse 145, and the respirations 45. The blood pressure was 146 systolic, 40 diastolic.

Examination of the blood on admission revealed a red-cell count of 4,500,000, with 90 per cent hemoglobin, but subsequent counts averaged about 3,500,000, with 70 per cent hemoglobin. The white-cell count was 14,000, with 59 per cent neutrophils, 27 per cent lymphocytes, 7 per cent monocytes, 1 per cent eosinophils, 1 per cent basophils and 3 per cent myelocytes. The red cells and platelets appeared normal on smear. The urine was negative. The bleeding and clotting times were both within normal limits. The serum nonprotein nitrogen was 30 mg. per 100 cc., the protein 6.4 gm., the calcium 9.8 mg., the phosphorus 6.1 mg. and the alkaline phosphatase 3.9 Bodansky units. The sodium was 136.1 milliequiv. per liter, the potassium 5.6 milliequiv., and

*On leave of absence.

the chloride 98 milliequiv. The van den Bergh reaction and the prothrombin time were normal. Nose and throat cultures were negative, as were cultures of the blood, spinal fluid and stools. A blood Hinton test, including dilutions, was negative. Determinations of the serum protein-bound iodine on the third and fourth hospital days were 9 and 9.3 microgm. per 100 cc., respectively (these are borderline, high-normal values).

A roentgenogram of the chest revealed marked enlargement of the heart to the left but no definite evidence of transposition of the vessels or engorgement of the pulmonary artery. The lungs were clear. Roentgenographic examination of the skull revealed bones of normal texture and density. The posterior fontanelle was closed, and the anterior fontanelle open, and there was no separation of the sutures. Lateral examination of the neck revealed widening of the posterior pharyngeal wall without tracheal obstruction. The thoracolumbar spine and bones of the lower legs were normal.

A lumbar puncture on admission yielded clear fluid dripping out slowly and containing 70 fresh (uncrenated) red cells and 1 to 2 lymphocytes per cubic millimeter. The Wassermann test was negative, and the sugar and protein were normal.

The patient's temperature ranged between 100 and 103°F. for the first four days, thereafter remaining approximately normal except for a brief rise to 103°F. on the seventh hospital day. The pulse continued to range between 120 and 180, and the respirations between 35 and 80. The blood pressure varied considerably, with high systolic and low diastolic pressures; one observer reported a reading of 300 systolic, 0 diastolic, on one occasion.

The child was given 2 cc. of paraldehyde in oil every four hours for sedation, 8 mg. of sodium phenobarbital being substituted after a few days. A diarrhea with three to six loose stools daily developed on the third hospital day and continued thereafter. Six thousand units of penicillin was administered every three hours over a period of nine days, and because of the diarrhea and poor appetite, the child was maintained for short periods on parenteral fluids. On the fifth hospital day thiouracil therapy was begun, 25 mg. being administered every six hours, and on the seventh day 2 drops of saturated potassium iodide solution was instituted daily as well. Although some observers thought that the size of the thyroid gland was diminishing, irritability, hypertonicity and frequent opisthotonic spasm continued.

On the twenty-first hospital day the child suddenly went into collapse, with gasping respirations and cyanosis. The pulse fell to 88, and the blood pressure to 78 systolic, 50 diastolic, and he seemed more relaxed than previously. A lumbar puncture at that time revealed fluid containing 500 fresh red cells but no white cells per cubic millimeter, 3 cc. of fluid being removed only with great difficulty. Ventricular taps on the following day revealed slightly bloody fluid containing 3800 fresh red cells per cubic millimeter on the left and cloudy fluid containing 800 fresh red cells on the right. The Pandy test was negative, and the sugar normal.

The child was treated with oxygen, 10 cc. of adrenocortical extract and glucose intravenously. During the ensuing thirty hours the child had frequent attacks of breathlessness and cyanosis and the pulse fell to 40 in spite of various stimulants. Death occurred on the twenty-third hospital day.

Differential Diagnosis

Dr. Robert Williams*: The nature and number of the observations made in this case are such that in the search for their solution one is led through most of the main general divisions of pathology. It is necessary to give some consideration to traumatic birth injuries, infections, neoplasms, metabolic disorders and congenital anomalies. The accumulated data in the case are such as to make one consider direct or indirect involvement of widespread sites in the body. There are suggestions of disorders in the head, neck, chest and abdomen. At the outset, however, it should be mentioned that in children, particularly in infants, one may observe symptoms and signs in several systems other than the ones directly involved. For example you will recall how commonly one sees evidence of central-nervous-system stimulation and gastrointestinal-tract alterations in a large number of diseases of childhood that cause no direct involvement of these systems. It is also well to recall that, for a given amount of disease, children respond much more markedly with changes in temperature, pulse rate, blood pressure and respiratory rate. Moreover, in some respects the physical signs in normal, as well as in abnormal children, differ from those of adults. For example, the liver edge is more frequently palpated in normal children. The tendon reflexes are often exaggerated, the abdominals absent, and the Babinski positive. In infants there may be serious cardiac lesions producing a paucity of physical signs, whereas in adults the same type of lesion usually causes pronounced signs. Finally, a young child is not likely to have multiple diseases, although there may be multiple disturbances of the same general nature.

With these general principles in mind we may next consider critically the data presented chiefly in the light of anatomic disturbances and without an attempt to integrate the entire picture. Alterations in the nervous system should be considered seriously because of the marked irritability, the hypertonicity, the opisthotonos, the bulging in the occipital region, the hyperactive reflexes, the positive Babinski, Gordon and Oppenheimer signs and the bloody cerebrospinal fluid. The frequent insignificance of many of these signs, however, has

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already been discussed. It can also be pointed out that there is a condition, designated as the hypertonic infant, in which no significant pathologic alteration has, to my knowledge, been found, with some of the characteristics of the case under consideration: irritability, prolonged crying, hyperactive tendon reflexes, muscle spasm, opisthotonos, flexion of the arms and legs, clenching of the hands, diarrhea and a slow gain in weight. It is to be emphasized that although the cerebrospinal fluid was bloody on four occasions, each time the red cells appeared fresh, and there was no xanthochromia, increased protein or increased white-cell count. Furthermore, there was no evidence of increased spinal-fluid pressure. Therefore, although the central-nervous-system changes are suggestive of disease, they are not convincing.

Exophthalmos is often a helpful sign, but it may occasionally be misleading. In addition to being a manifestation of Graves's disease, it may be due to tumors or infections in the orbit, increased venous pressure, small orbits and retention of orbital fluid, as in nephritis and hypertension. It may also be a racial characteristic, occurring especially in Italians. The equality of the exophthalmos on the two sides, the absence of obvious edema of the orbits, the absence of papilledema, and the absence of evidence of abnormal masses in the cranium help to reduce the etiologic factors that must be considered.

In considering the bruit in the neck it must be stressed that, whereas it was heard over the thyroid gland, it was also heard at the base of the skull. Whether the bruit was of the same order as the murmur heard in the neck and back and over the precordium must be borne in mind. It is of significance that no masses or dilated vessels were palpated in the neck or elsewhere. The thyroid gland was questionably enlarged, but whether the enlargement was due to Graves's disease, to increased vascularity of the neck or to some other cause must be considered.

The changes in the cardiovascular system are the most convincing of any. There is no reasonable doubt about the heart being distinctly enlarged. The repeated blood-pressure estimations revealed a distinct elevation in the systolic pressure and a drop in the diastolic pressure. The murmur heard over the lower precordial region, back and neck was of sufficient intensity to appear significant. The pronounced tachycardia, tachypnea and some cyanosis indicate that the cardiovascular system was burdened.

The liver may be considered to have been slightly enlarged, as perhaps the spleen.

Aside from the roentgenograms the laboratory findings are of no particular aid, except by their negative character.

In the differential diagnosis I have given some consideration to a rather large number of diverse conditions, among them being brain tumor, various infections, traumatic injuries, Graves's disease, von Gierke's disease, the infantile type of Gaucher's disease, Niemann–Pick's disease, pheochromocytoma, venous hums, arteriovenous aneurysm, patent ductus arteriosus, coarctation of the aorta, patent septal defects and a number of other congenital heart diseases. To be sure, I readily dismissed many of these entities from consideration since, although they satisfied some criteria, they were at a loss in explaining others. Since most of the positive data had reference to the cardiovascular system, and since this was an infant who apparently had never been well, chief consideration was given to congenital cardiovascular anomalies. The chief problem is to explain a large heart with presumably competent valves but with peripheral manifestations of aortic insufficiency and with murmurs or bruits over the lower precordium, back, neck and temporal regions. Lest I have been too hasty in discarding some of the data, however, I shall briefly review the features of this case in the light of other diseases.

Let us consider brain tumor. There were no convincing neurologic signs of a brain tumor and no definite abnormalities of the cerebrospinal fluid—at least the abnormalities present are open to question. There was a negative skull plate. There were many positive cardiovascular signs, indicating that there was a great deal of trouble other than what might have been caused by a brain tumor.

Infection is suggested by the fever, the tachycardia and so forth; but against infection are the negative cultures from many sites. Infection could not explain many of the cardiovascular findings, but it still might be considered as the cause of the terminal event.

The next condition to discuss is trauma. This is considered particularly because of its etiologic significance in arteriovenous aneurysms. There was no history of injury at birth or subsequently, and there was no definite physical evidence of it.

Metabolic disorders might be discussed next. The first among these is thyrotoxicosis. As a matter of fact, as one rapidly reads the characteristics of this infant's disease there are many features that one might consider as favoring thyrotoxicosis. For example, the four cardinal features of thyrotoxicosis in children are readily apparent: exophthalmos, nervousness, questionable goiter and tachycardia. Against this diagnosis, however, are the extreme rarity of the disease at this age, the essentially normal protein-bound iodine and the fact that the response to treatment was not particularly good. Furthermore, thyrotoxicosis will by no means explain all the cardiovascular features.

N.B.

The next condition for consideration is von Gierke's or glycogen-storage disease. In favor of it is the extremely large heart with some enlargement of the liver and perhaps splenomegaly. It is also of some little interest in this connection that the child

was said to have been well developed muscularly; in this disease one may actually get hypertrophy of some of the muscles. Von Gierke's disease, however, does not explain the wide pulse pressure or the murmur.

This child had certain features that one observes commonly with Gaucher's disease, although they are not pathognomonic of the disease, these being the rapid course of the disease, the nervous symptoms, the slow weight gain, the enlarged liver and spleen, the opisthotonos, the increased reflexes and the spasticity of the limbs. But I find it difficult to explain the cardiovascular findings on this basis.

Some of the comments that I have made on Gaucher's disease apply to Niemann–Pick's disease and Schüller–Christian's disease. The latter need not be given much consideration. It might explain the exophthalmos, but there was no defect in the bones, and no diabetes insipidus, and this disease would not explain the cardiovascular changes.

Finally we come to the congenital anomalies. As I have mentioned before, the fact that the child's trouble dated from birth and the fact that most of the features seemed to be related to the cardiovascular system make one begin to give great emphasis to the possibility that there was a congenital anomaly somewhere in the vascular system.

First we might consider the possibility of a cranial arteriovenous aneurysm. Although I have cast some doubt about the validity of the neurologic data, both clinical and laboratory, and whereas there is good reason for attributing significance to certain specific observations when one considers them as a whole, they do indicate that there might have been organic disease somewhere in the cranium. Arteriovenous aneurysm in the cranium would explain the bruit that was heard at the base of the brain. Such a bruit is one of the most characteristic features of such a lesion. It might also explain the exophthalmos. To be sure, when there is exophthalmos on the basis of arteriovenous trouble it is apt to be unilateral, but I can conceive how it could be bilateral. Furthermore, one can consider the peripheral vascular manifestations, simulating aortic insufficiency, as being on the basis of arteriovenous aneurysm, but I must say that the peripheral changes are quite pronounced and out of proportion to what one usually observes with such an abnormality.

We might consider a cervical arteriovenous aneurysm or one in the extremities. Such an entity would account for the high pulse pressure, with a high systolic and a low diastolic pressure, cardiac dilatation and hypertrophy, cyanosis, tachycardia and the bruit in the neck. Furthermore, in peripheral arteriovenous aneurysm, murmurs in the heart have been described, even though there is no direct abnormality in the heart itself, although, to be sure, these murmurs are usually not very loud. Against the possibility of arteriovenous aneurysm in these sites is the fact that we have no mention of evidence of localized venous engorgement or edema. I believe that, with all the peripheral alterations in the vascular system, one should be able, particularly in a small child, to palpate the arteriovenous mass, unless it was hidden in the brain or in the thorax.

We may consider a patent ductus, which is also an arteriovenous aneurysm but is located in the chest. In favor of this are the signs of an arteriovenous aneurysm in the absence of a peripheral arteriovenous aneurysm. There are loud pulmonic and aortic second sounds, with the pulmonic being louder than the aortic. With patent ductus arteriosus the most classic feature is a machinery-like murmur, which one hears almost always in the second left interspace, close to the sternum. That murmur is absent here. The second most important point, a characteristic configuration of the heart and great vessels, was not present in this case.

Coarctation of the aorta should be considered because of the high systolic pressure that was found in a child that had a good chance to have a vascular anomaly. The diastolic pressure, however, was definitely low, and unless there was some other abnormality associated with coarctation, the diastolic pressure should have been normal, if not elevated. There were no murmurs or other good physical signs indicating the presence of the stenosis. Because of the relatively loud murmur heard in the fourth and fifth interspaces parasternally on the left, and because of the absence of good evidence for valvular disease and murmurs in the region of the base of the heart, one should probably also consider the possibility of interventricular septal defect. This child could well have had this abnormality. There is not much evidence for it, but it is difficult to rule it out.

In conclusion, on considering the picture as a whole, it seems to me that the data indicate that this child had an arteriovenous shunt, accompanied by cardiac dilatation and hypertrophy. The evidence available does not permit one to say specifically where the shunt was located. The best I can say is that it was either in the cranium or in the thorax.

DR. NATHAN B. TALBOT: I saw this child during the early part of the hospital stay and am frank to admit that clinically, with the aid of numerous consultants, it was impossible to come to any definite conclusion. Although we carefully considered the possibility that the infant had thyrotoxicosis, we also were at times worried that there was a significant intracranial lesion of some type.

DR. CLEMENS E. BENDA: I think that the neurologic symptoms did not attract sufficient attention. Even if the positive Babinski sign was of little significance, the child had opisthotonos and severe spasticity. There was flexion of the legs and of the arms, with clenched fists. The head was bent back-

ward, and the eyes showed protrusion, which is so frequently seen in infants with intracranial hemorrhage, as demonstrated by Dr. Ingraham.*

I do not see how anyone can explain the neurologic symptoms on the basis of anything except an intracranial lesion, and I do not believe that one can disregard the possibility of an intracranial hemorrhage. Although prematurity in itself is of no pathological significance, many studies have demonstrated that premature babies are particularly likely to have intracranial hemorrhages because of the immaturity of their vascular system. The frequency of intracranial hemorrhages increases with the decrease in birth weight. For example, 76 per cent of all premature babies weighing less than 3½ pounds were found to have some kind of intracranial hemorrhage. Since this child did not have immediate dramatic symptoms after birth it is probable that the lesion was related to the venous system, from which blood was seeping out slowly, the difficulty not becoming recognizable until several weeks after birth.

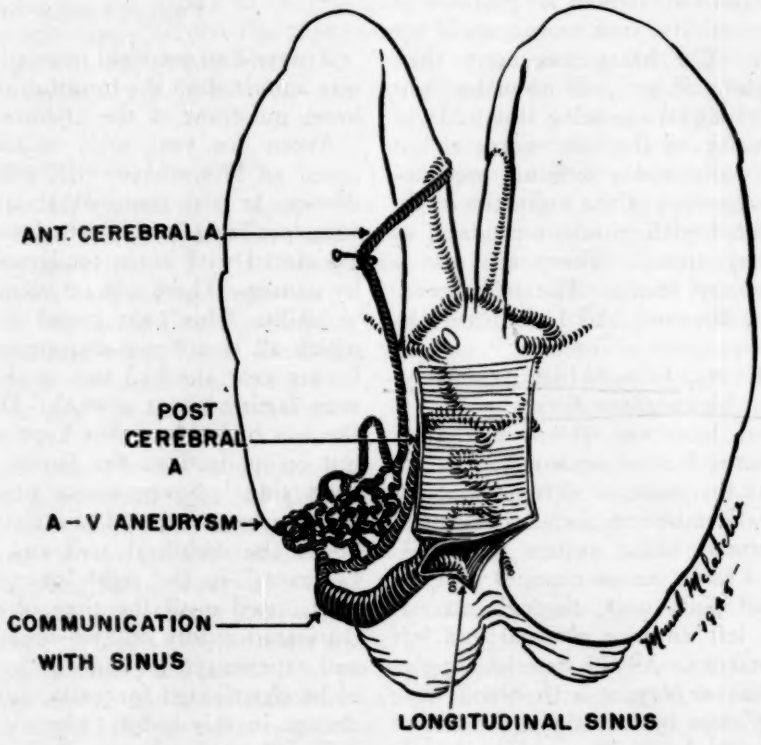

FIGURE 1.

DR. JACOB LERMAN: When I saw the youngster I thought that the most important diagnosis to be considered was hyperthyroidism, with or without an accompanying neurologic disorder. In other words, the neurologic picture seemed to be independent of hyperthyroidism. The child had definite exophthalmos, particularly marked in the side view, and a loud bruit in the neck; he was extremely active and underweight. I believe that I was alone in thinking that the thyroid gland was enlarged — I was quite sure that both lobes were increased in size. The child seemed to possess all the criteria necessary to make a diagnosis of Graves's disease. When the blood iodine came back as 9 microgm. per 100 cc., which is a high normal, it seemed to be confirmatory of the diagnosis. It is true that in the end the patient did not do well, but in the first few days he seemed to improve and, as I recall, the impression of hyperthyroidism became more plausible. Such a diagnosis, however, did not explain his other manifestations.

DR. TALBOT: I can back up Dr. Lerman's remarks by the statement that this baby presented the most extraordinary degree of hyperactivity, seemingly not only physical but also, one might say, metabolic.

CLINICAL DIAGNOSIS

Thyrotoxicosis.

DR. WILLIAMS'S DIAGNOSES

Arteriovenous aneurysm, cranial or thoracic.
Cardiac dilatation and hypertrophy.
Terminal infection.

*Ingraham, F. D., and Matson, D. D. Subdural hematoma in infancy. *J. Pediat.* 24:1-37, 1944.

Anatomical Diagnoses

Cerebral arteriovenous aneurysm.
Cardiac hypertrophy and dilatation.
Bronchopneumonia.
Pulmonary edema.

Pathological Discussion

Dr. Benjamin Castleman: The autopsy on this child showed a thyroid gland that weighed 1.4 gm. and, so far as we could tell, showed no evidence of hyperplasia or hyperactivity, such as one would see in hyperthyroidism. The heart was more than normal in size, weighing 55 gm., the normal weight of the heart in a child of this age being about 20 gm. There was hypertrophy of the left ventricle, but no anomalies. The child had a terminal bronchopneumonia, a bit suggestive of the aspirative type; the bronchi were filled with purulent exudate, as were the surrounding alveoli. There was also a rather severe pulmonary edema. The real disease was in the cranium, however, and I shall ask Dr. Kubik to describe it.

Dr. Charles S. Kubik: I should like to congratulate Dr. Williams on his excellent discussion.

The left occipital lobe was absent — whether through degeneration or lack of development is not altogether clear. At the posterior extremity of the defective left cerebral hemisphere there was a cluster of thin-walled, tortuous blood vessels that communicated through a large venous channel with the superior longitudinal sinus and, through arterial branches, with the left anterior cerebral and left posterior cerebral arteries. All the arteries supplying the arteriovenous aneurysm with blood were enlarged to at least three or four times the size of the corresponding normal arteries — as is the rule with any artery proximal to an arteriovenous fistula. The arteries affected were both vertebrals, the basilar, both internal carotids, the left anterior cerebral, the left posterior cerebral and the right anterior cerebral only as far as the anterior communicating artery (Fig. 1). Cardiac enlargement is also found in these cases.

Two patients with similar arteriovenous aneurysms, having connections between the anterior and posterior cerebral arteries and the superior longitudinal sinus, have come to autopsy at this hospital. One was a man in his early twenties, and the other was a man about sixty years old. The former died as the result of hemorrhage from the abnormal vessels. The other had a subdural hematoma. In both cases, calcification of the abnormal tortuous vessels was visible by x-ray. In still another case the patient was a woman of twenty-eight with multiple arterial connections between a greatly enlarged lateral sinus and the basilar, middle meningeal and occipital arteries.

Thus patients with intracranial arteriovenous aneurysms may live many years, and I should not suppose that death in the present case was caused by the arteriovenous aneurysm. A possible explanation of exophthalmos was increased venous pressure transmitted from the superior longitudinal sinus through anastomotic veins to the cavernous sinuses and from there to the ophthalmic veins.

CASE 31072

Presentation of Case

A sixty-four-year-old married multiparous woman was admitted to the hospital with pain in the right lower quadrant of the abdomen.

About one year prior to admission the patient noted an intermittent dull aching pain in the abdomen, at first centered about the umbilicus but soon localizing in the right lower quadrant. It was associated with some tenderness and accompanied by nausea. There was no vomiting, diarrhea, fever or chills. This pain lasted about six days, after which all symptoms disappeared. During the following year she had two or three similar episodes, each lasting about a week. During some of them she was bedridden. She kept about her housework but complained to her family of "soreness in the right side." Seven weeks prior to admission she noted a recurrence of the distress, at first intense about the umbilical area and finally localizing as "soreness" in the right lower quadrant. This attack lasted until the time of admission. She was nauseated mildly on two occasions, never vomited and experienced no chills or fever. She had tended to be constipated for years, and there had been no change in this habit. She took laxatives sporadically. She had never noticed any blood.

Ten years prior to admission she had had a hemorrhoidectomy. One of her sisters had died of tuberculosis.

Physical examination revealed a well-developed and well-nourished woman in no acute distress. The lungs were clear. The heart revealed questionable enlargement to percussion. Systolic murmurs were heard at the apex and over the aortic area, and systolic and diastolic murmurs at about the level of the third interspace to the left of the sternum. There was slight tenderness over a definite mass on deep palpation in the right lower quadrant.

The temperature, pulse and respirations were normal. The blood pressure was 130 systolic, 80 diastolic.

The hemoglobin was 13.6 gm. The urine — a voided specimen — had a specific gravity of 1.023, with a + test for albumin and many white cells in the sediment. A stool examination was guaiac negative. A blood Hinton test was negative.

A roentgenogram of the chest revealed increased pulmonary markings throughout. The heart was enlarged, principally in the region of the left ven-

tricle. The aorta was somewhat dilated, and a double ring of calcium was visible at the arch. An intravenous pyelogram revealed some lateral displacement of the right kidney, but no other abnormalities were observed. A round shadow was visible in the right upper quadrant, consistent with a gallstone. The lumbar spine showed mild degenerative changes, all the bone appearing decalcified. A barium enema revealed a retrocecal appendix and an irregular defect lying along the posterior aspect of the cecum and ascending colon corresponding to the palpable mass. The colon was somewhat fixed at that point, but the mucosal pattern appeared to be intact.

On the fifth hospital day a laparotomy was performed.

Differential Diagnosis

Dr. Leland S. McKittrick: I should like to look at the x-ray films, although, as I have said many times, I am never sure whether Dr. Holmes is going to help or disturb me by showing them.

Dr. George W. Holmes: You should have been here a short while ago when I was discussing the differential diagnosis of a case and had my first opportunity of making the same statement to the surgeons.

The first thing I notice is that in this intravenous pyelogram there is evidence that the patient did not concentrate urine well. The kidneys are about normal in size, and I do not see any definite evidence of tumor. In the chest film I observe a ring of calcification in the aorta and a great deal of arteriosclerosis, with some tortuosity of the aorta and enlargement of the left side of the heart. This picture can go with hypertensive and arteriosclerotic heart disease. It looks to me as if the colon emptied well; they apparently became interested in the cecal area, but I do not believe that they saw anything.

Dr. McKittrick: Where is the appendix?

Dr. Holmes: It is retrocecal — an unusual position. There is a tendency for the cecum to contract, possibly because it was somewhat irritated. The cecum is a little high.

Dr. McKittrick: As one reads this history it seems too simple. It just cannot be true. I place a great deal of stress on the history in certain conditions. The problem here is, Did this woman have a tumor of the cecum or an inflammatory lesion? If she had a tumor of the cecum, was it carcinoma or lymphoma? If it was inflammatory, was it tuberculosis, a granulomatous tumor such as one gets in regional enteritis or just appendicitis? I do not believe that the patient had carcinoma. Carcinoma gives symptoms that primarily fall roughly into three groups — symptoms because of the anemia that is frequently associated with it, those referable to obstruction and those due to the local inflammatory reaction when the serosal layers are involved. I do not believe that she had a carcinoma a year ago giving symptoms and signs resembling an inflammatory lesion in the right lower quadrant with localized tenderness. That, in addition to the absence of evidence of obstructive symptoms, the absence of bowel irregularity and the normal hemoglobin, makes me entirely satisfied to leave carcinoma out of the picture.

I do not know how to bring lymphoma into the picture, or how to rule it out, except that she had no evidence of interference with the mucosal outline. There is nothing one can make out from the x-ray to suggest tumor of the cecum itself, and again the history does not fit into it.

I cannot say that she did not have tuberculosis, however. She had increased lung markings and had had a sister who had died of the disease — in fact, the history does all it can to call our attention to it; but I do not believe she had it.

Here is a woman who had a series of attacks of pain and was well between the attacks, when all the symptoms disappeared. She then had abdominal discomfort localized in the right lower quadrant. Of course that is the picture that we teach students is characteristic of appendicitis. As I read the story and got down to the last attack of several weeks' duration I fully expected to hear about a mass in the right lower quadrant. It apparently was there. Whether or not that was a red herring, I do not know. Chronologically it fitted all right. I thought she had an inflammatory process. If she had an inflammatory process about the best bet is appendicitis. The little appendix stub that Dr. Holmes pointed out fits into the picture perfectly.

She may have had a diverticulum of the cecum with recurrent episodes of discomfort. Although she may have had recurrent episodes of appendicitis during the year before entry, the final attack may have been due to a new disease unassociated with it. But it seems to me that I have to connect up the history of the past year with the story of the findings of this brief admission, particularly when they dovetail into each other all right. I had hoped to be able to give a better differential diagnosis of inflammatory lesions occurring in the right lower quadrant, but to me the only logical diagnosis I can make is appendicitis with an inflammatory reaction — a low-grade appendiceal abscess that we all too frequently see.

Dr. Jacob Lerman: This patient apparently had some form of heart disease, and from the description one has to suspect syphilitic heart disease with aortic regurgitation. She had both diastolic and systolic murmurs with left ventricular enlargement and a normal blood pressure; it could hardly have been due to hypertension so it must have been caused by aortic regurgitation. I should think one would have to tie that in some way.

Dr. McKittrick: As I looked at the x-ray films I wondered if it could possibly have been an aneurysm. She had calcification in the aortic knob. She

had, as you say, cardiovascular disease, and I wondered how an aneurysm would fit into the picture. In the first place I do not believe that the history fits it, at least not to my satisfaction. There is no vessel under the cecum that could cause an aneurysm or could cause a mass.

DR. EDWARD HAMLIN, JR.: I should like to hear further discussion of the filling by barium in a chronically or recurrently infected appendix.

DR. MCKITTRICK: I cannot discuss it, but as I looked at the x-ray films, the thin line of barium suggested a nubbin of appendix. How do I know that several centimeters have not sloughed off? When Dr. Holmes showed the film I was not disturbed about it because I thought that fitted into the picture all right.

DR. HOLMES: As a rule, in an appendiceal abscess one does not see the appendix at all, but there are exceptions; I more or less agree with what you say.

DR. ARTHUR W. ALLEN: The man who saw this woman during her attack a year before entry made a diagnosis of appendicitis. Since she was not a good operative risk, he did not take the appendix out at that time. She recovered from that attack down in the country and then had another; since she finally developed a mass that did not go away, he sent her in here.

We also thought that it was appendicitis. So did the X-ray Department. But when we went back over the various cases of appendicitis forming abscess in this region that we had mistaken for tumor, we did not find any with recurrent attacks. All these patients came in with the first episode, when they developed an abscess. We thought that this was inflammatory, since the mass was a little more tender than one would expect with a carcinoma.

We explored the patient under the diagnosis of appendicitis, in spite of the fact that she had had several attacks. When we exposed the area, we could see the whole appendix lying along the lateral wall of the cecum, and palpating through the cecal wall, we easily felt a mushroom-like mass that was about 3 cm. in diameter. We did not disturb it too much but did an ileotransverse colostomy. Two weeks later we re-explored; the mass had not changed the slightest bit in the interval, which one would expect if it had been an ordinary inflammatory appendicitis. So rather than break into it we took out the right colon. I fear that I spoiled the specimen somewhat, because I wanted to see what it was myself. After taking out the whole mass intact, I eased the appendix off the adherent portion of the cecum. There was a granular area in the wall of the bowel about 2.5 cm. in diameter, but I still did not know the true nature of the process. I thought, however, that it was benign.

CLINICAL DIAGNOSIS

Chronic appendicitis, with abscess formation.

DR. MCKITTRICK'S DIAGNOSIS

Appendicitis, with chronic abscess.

ANATOMICAL DIAGNOSIS

Mucocele of appendix.

PATHOLOGICAL DISCUSSION

DR. BENJAMIN CASTLEMAN: As Dr. Allen implied, when we received the specimen we had a hard time putting the appendix back where it belonged. The proximal 5 cm. of the appendix looked perfectly normal. The serosa was shiny and thin, not at all edematous; but the tip was gone, and in its place we found some fat and inflammatory tissue that apparently belonged on the wall of the cecum, to which it was adherent. Sections showed a great deal of inflammation surrounding large masses of mucus. I believe that the patient had a mucocele of the distal portion of the appendix that apparently had broken but walled itself off. Since it was a retrocecal appendix, it lay against the wall of the cecum and remained there. There was no evidence of carcinoma. Only the distal 2 cm. of the appendix was involved; this is unlike the ordinary mucocele, which begins at the base and produces a balloon-like enlargement of the appendix.

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MEDICAL PREPAYMENT–INSURANCE PLANS

An item published elsewhere in this issue of the *Journal* calls attention to some of the results of a recent survey conducted by the Michigan Health Council, which is composed of the Michigan State Medical Society, the Michigan Hospital Association, the Michigan Medical Service and the Michigan Hospital Service. The survey utilized standard scientific sampling methods to obtain an accurate reflection of public opinion regarding medical matters. The item emphasizes the facts that the people of Michigan have faith in the medical profession, that the majority take advantage of medical-hospital prepayment-insurance plans if they are available and that medical plans sponsored by physicians are preferable to those offered by insurance companies or to those that might be controlled by governmental agencies.

What applies to Michigan probably represents the attitude of the people of Massachusetts, since the distribution of the inhabitants of the two states according to population density, occupation and income is quite similar. But this must be qualified by the assumptions that the medical prepayment-insurance plan is backed by *all* members of the medical profession, that minor complaints are handled through existing facilities for their adjustment and that the people of Massachusetts are informed concerning the advantages of the Blue Shield.

Many physicians in Massachusetts, particularly specialists, have failed to register as participating physicians with the Blue Shield. A certain number of these object to this inevitable change in the practice of medicine. On the other hand, there are undoubtedly many who refuse because of purely selfish reasons, saying that they "cannot afford to be listed." It is acknowledged that the original fee schedule contained many inconsistencies, which are now in the process of being corrected by groups of specialists, but on the whole, the set fees are reasonable and proper returns for the care of patients whose incomes are sufficiently low to permit them to participate as unlimited subscribers. This opposition on the part of physicians was also experienced in Michigan during the first few years of its medical prepayment-insurance plan, but recently the scheme has received enthusiastic support by the entire profession. Indeed, at the last meeting of the House of Delegates of the Michigan State Medical Society it was unanimously voted that the officers and directors of Michigan Medical Service be commended for their achievement in furnishing several hundred thousand people with medical care on a prepaid basis in a manner that was highly satisfactory to both the patient and the physician and that had resulted in better feeling and understanding between the public and the medical profession.

Another practice that tends to lower confidence is the publicizing of complaints by either subscribers or participating physicians. No plan of

this sort is perfect, particularly in the early days of its existence, but ample facilities have been provided, both in the district societies and in the central organization, for the consideration and ironing out of the difficulties that are sure to arise.

Obviously, a public that is ignorant of the existence of the Blue Shield or of any other medical prepayment-insurance plan cannot be expected to support it. One significant point brought out by the survey of the Michigan Health Council is that three quarters of the people interviewed had never heard of Michigan Medical Service, in spite of the fact that the state has a larger percentage of its inhabitants enrolled in medical-hospital prepayment-insurance plans than has any other state. Such information, of course, must be supplied in Massachusetts either by physicians or by the representatives of the Blue Shield.

The answer to proposals for government-controlled medicine lies in the ability of states or their subdivisions to devise and to consummate plans that aim to correct the deficiencies that are known to exist. The Blue Shield was created by the Massachusetts Medical Society for this very purpose, and all members of the Society should do their utmost to ensure its success.

VITAMINS AND GRAY HAIR

In the field of vitamins there has sometimes been a tendency in this country for clinical exploitation of the results of laboratory investigations before those findings have been adequately substantiated, and long before their full import and applicability have been ascertained. This has been particularly true in the treatment of conditions in which the evaluation of the results is partly or wholly subjective. One recent outstanding example has been the widely publicized use first of para-aminobenzoic acid and then of pantothenic acid, either alone or in combination with para-aminobenzoic acid, for the restoration of the original dark color of graying hair in man.

Perhaps the earliest experimental production of achromotrichia was by Oettel,[1] who in the course of studies on the toxicity of hydroquinone observed the graying of the fur of cats. Martin and Ansbacher[2] several years later confirmed these observations and succeeded in producing achromotrichia in mice that could be cured by the feeding of rice-polish concentrate or of small amounts of para-aminobenzoic acid. They believed that the latter was a factor in the vitamin B complex. Ansbacher[3] also claimed that para-aminobenzoic acid was a vitamin essential for the growth of chicks and that it was also required by rats for growth and for the maintenance of normal fur. In the rat it has since been shown that a deficiency of pantothenic acid causes poor growth, dermatitis, adrenal hemorrhages and graying hair.[4] There is reason to believe, however, that achromotrichia is probably a multiple deficiency of para-aminobenzoic acid, pantothenic acid and inositol and that there are certain interrelations between these substances and perhaps others as well.

In the course of studies on the action of sulfonamides, Woods[5] showed that certain yeast extracts contained a substance that prevented the action of sulfanilamide, and his studies indicated that the action could be duplicated by para-aminobenzoic acid. It was therefore postulated that para-aminobenzoic acid is an essential metabolite in the growth of bacteria. Thus, the action of sulfonamides may be explained on the basis of a competition with para-aminobenzoic acid, the chemical structure of which is quite similar. When the latter is replaced by a sulfonamide, subsequent metabolic activities necessary for the growth and multiplication of bacteria are stopped.[6]

All these findings in themselves are of considerable interest, but they do not necessarily indicate clinical therapeutic applications. In the case of the sulfonamide-inhibitory action of para-aminobenzoic acid, substances supposedly the same or related to the latter are present in exudates and in tissue juices and they, too, tend to prevent sulfonamide action. On the other hand, para-aminobenzoic acid has been found to have no effect either in preventing or in curing some of the toxic effects of the sulfonamides, such as drug fevers and rashes.[7] Another important aspect of the application of para-aminobenzoic acid in human therapy that is not adequately taken into account by some of those who advocate its use, particularly in small and infrequent doses, is the

fact that this substance, as well as pantothenic acid, is completely and rapidly eliminated from the body, there being practically no storage.[8] Thus, in a clinical trial of its effectiveness in the treatment of typhus fever,[9] the doses used every two hours were from five to twenty times the daily doses advocated for the patient with gray hair.[10] Furthermore, when given for long periods and in quantities adequate to maintain significant concentrations in the blood, the possibility of toxic reactions similar to those resulting from sulfonamides or from thiouracil may be anticipated.

Because of the interest aroused by the reports of the effect of calcium pentothenate and para-aminobenzoic acid on the color of gray hair in human beings, Brandaleone, Main and Steele[11] conducted a series of studies designed to clarify the confusion concerning which of these compounds is the more important. Each substance was fed alone and in various combinations with yeast. They found no significant decrease in the gray color of the hair from the use of these substances over a period of six to eight months.

Another concept often ignored by those who enthusiastically advocate the use of vitamin supplements is the great difficulty encountered in attempts to produce specific deficiencies, even in experimental animals. The conditions under which such deficiencies are induced are extremely artificial and require the administration of highly purified diets, often deficient in many substances. In man, specific deficiencies are also extremely difficult to produce or to maintain in those who take anything resembling a normal diet. Furthermore, the addition of vitamins to the normal diet has been shown recently to have no beneficial effect in otherwise healthy individuals.[12]

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MASSACHUSETTS MEDICAL SOCIETY

The BLUE SHIELD

The people have faith in the medical profession. They want medical security, and the majority want the job done through voluntary prepayment health plans sponsored and controlled by the medical profession.

These are the basic conclusions that can be drawn from the results of a recent survey of public opinion in Michigan. The survey was sponsored by the Michigan Health Council and utilized standard scientific sampling methods to obtain an accurate reflection of opinion throughout the state.

Some of the questions and the answers are as follows:

As a group, do you think doctors of medicine are doing a good job for the public?

"Yes," 91.6 per cent; "No," 4.2 per cent; and "Don't know," 4.2 per cent.

In general, what are your "pet peeves" regarding the medical profession?

"Doctors overcharge," 6.5 per cent; "Doctors keep patients waiting," 4.4 per cent; "Doctors are dishonest," 5.6 per cent; "Doctors lack interest in patients," 1.7 per cent, and "No peeves," 81.8 per cent.

Is the medical-hospital plan for employees available where you work? If so, do you belong?

The responses to the latter question were "Yes," 72.6 per cent; "No," 13.9 per cent, and "Don't know," 13.5 per cent.

If you were asked to choose, which would you prefer?

Voluntary prepayment program sponsored by the medical profession. 33.7 per cent.

Government-controlled program. 15.5 per cent.

Regular insurance. 13.4 per cent.

Payment for service at time rendered. 26.6 per cent.

No preference was expressed in 10.8 per cent.

The answers indicate that the people have confidence in physicians, that they have few complaints, that nearly three quarters subscribe to a medical-hospital prepayment insurance if it is available and

that, when they know there is a choice, they prefer a prepayment medical plan sponsored by physicians.

The Blue Shield is the medical prepayment plan in Massachusetts. Nearly 4000 doctors are already participating physicians, but the support of *every* physician is needed so that a united front can be presented to the people and so that it can be said, "The job will be done and done right by the medical profession itself."

If you are not yet a participating physician in the Blue Shield, join your colleagues who are already pioneering in this rapidly developing movement. Write to the Blue Shield (230 Congress Street, Boston) today for complete information.

TREASURER'S OFFICE

The *New England Journal of Medicine* is sent to all fellows whose dues are fully paid. Fellows who have not paid for the current year by March 1 are automatically dropped from the mailing list. To avoid this, it is urged that all fellows pay their dues by this date. Furthermore, the annual refund to district societies is based on the number of payments received in each district by March 1.

ELIOT HUBBARD, JR., *Treasurer*

DEATHS

BONNEVILLE — Alfred J. Bonneville, M.D., of Hatfield, died January 11. He was in his seventy-fourth year.

Dr. Bonneville received his degree from the Medico-Chirurgical College of Philadelphia in 1911. He was vice-president of the Hampshire District Medical Society in 1920 and president in 1921. He was district supervising censor and councilor of this Society from 1922 to 1945. Last year Dr. Bonneville was cited by Governor Saltonstall for his work in civilian defense. He was on the staff of the Cooley Dickinson Hospital, Northampton, and a fellow of the American Medical Association.

His widow and three sisters survive.

HASLAM — Frank A. Haslam, M.D., of Allston, died December 31. He was in his eighty-third year.

Dr. Haslam received his degree from the Harvard Medical School in 1885.

His widow survives.

RICHARDSON — Chesley A. C. Richardson, M.D., of Somerville, died January 30.

Dr. Richardson received his degree from McGill University, Montreal, in 1904. He was a member of the executive board, chief surgeon and president of the Medical Staff at the Somerville Hospital and a member of the American College of Surgeons.

His widow and a brother survive.

THOMPSON — Charles O. Thompson, M.D., of Boston, died January 29. He was in his eighty-third year.

Dr. Thompson received his degree from Columbia University College of Physicians and Surgeons, New York, in 1889. He was a trustee of the Massachusetts College of Pharmacy and a fellow of the American Medical Association.

His widow, a son and a daughter survive.

MISCELLANY

ANNUAL MEETING OF WASHINGTONIAN HOSPITAL

The Washingtonian Hospital for the Treatment and Prevention of Alcoholism held its annual meeting on Tuesday, January 9, in the hospital building at 41 Waltham Street, Boston.

In his report on the activities of the hospital during the past year the medical director, Dr. Joseph Thimann, said that 1134 alcoholic patients had been treated, an increase of 6.6 per cent over the admissions of the previous year. In a group of about 300 patients who were given treatment beyond routine detoxication (part-time protection, psychotherapy and so forth), 25 selected patients received the conditioned-reflex treatment. Since this plan of therapy was started at the hospital, in February, 1942, 111 patients have undergone such treatment, and successful results (permanent total abstinence) have been obtained in 70 cases (63 per cent).

Following the business meeting of the Corporation, the secretary of the Abstinence Club contrasted the early years in the hospital's history, when little or no treatment was given, with present-day conditions. Dr. Arthur H. Ward, acting chief of the Out-Patient Department, then described the work of his department, stating that psychotherapeutic interviews had been given to 200 outpatients during 1944.

Three new members were elected to the Board of Directors: Mr. Courtenay Guild, who for many years has been a member of the corporation and interested in the work of the hospital; Dr. John E. Gorrell, assistant director of the Massachusetts General Hospital; and Mr. Henry L. Johnson, of Utica, New York. Dr. Hilbert F. Day was re-elected president, Mr. Amos B. Little, treasurer, and Colonel George B. Stebbins, clerk.

ONE HUNDRED YEARS IN THE CONSERVATION OF LIFE

In 1842, a young Quaker named Alpheus Phineas Sharp from Winchester, Virginia, was the first graduate of the Maryland College of Pharmacy. Three years later, or just one hundred years ago, he opened a drugstore at Pratt and Howard streets in Baltimore, a store that was destined to develop into the pharmaceutical and biological laboratories of Sharp and Dohme of today. The store was located in a small two-story brick building, and in the transom over the door he placed a painted piece of glass bearing the words ALPHEUS PHINEAS SHARP — APOTHECARY. His stock in trade included the standard household remedies of the day, together with imported perfumes, sponges, combs, chemical glassware and other items carried by the drugstore of a century ago. But he filled prescriptions, too, and it was in this field particularly that his ability and knowledge brought to him the confidence and respect of medical men and his brother pharmacists. The business increased and prospered.

In 1852, a rosy-cheeked boy of fifteen came into the store and asked for a position as apprentice. Mr. Sharp liked the eager energy of the boy and apprenticed him. It was the beginning of a lasting friendship and firm business relation, for the boy was Louis Dohme. He cleaned the store, received instruction from Mr. Sharp, carried Mrs. Sharp's market basket, slept in a back room, ate with the family and between times attended the Maryland College of Pharmacy. His hours were from six in the morning to midnight, and his salary three dollars a week. At the college he studied under Dr. Louis Steiner, who imbued him with the conviction that chemistry was the foundation of good pharmacy. He graduated in 1857 and became senior clerk. In 1860 he was made a partner and the firm name was changed to Sharp and Dohme.

The Civil War, with its requirement of large stores of medical supplies, brought further impetus to the growing business. In 1865 the building next to the store was purchased and the manufacture of an extensive line of pharmaceutical products was begun.

In the meantime, Charles, a younger brother of Louis Dohme, had entered the Maryland College of Pharmacy. He graduated in 1862 and later entered the employ of Sharp

and Dohme. His son, Dr. Alfred R. L. Dohme, later became head of the company and is still a director.

A senior clerk of the Sharp and Dohme store at that time, who later became a nationally known figure in pharmacy, was Charles Caspari, Jr. When he later opened his own store, Alfred R. L. Dohme served an apprenticeship with him, and for many years these two men worked together in determining assay methods of drugs that are still official in the *U. S. Pharmacopoeia*. Dr. Dohme became a member of the Revision Committee in 1891 and remained on it for thirty years.

Both Louis and Charles Dohme were presidents of the Maryland College of Pharmacy, and both Charles and Alfred R. L. Dohme were presidents of the Maryland Pharmaceutical Association and the American Pharmaceutical Association. Louis Dohme was a member of the *U.S.P.* Revision Committee, and Charles the chairman of the Board of Trustees of the *U.S.P.* Convention.

During these early years the company's operations were expanding steadily. Branches were established in New York in 1885, Chicago in 1888, New Orleans in 1890, Atlanta in 1893 and San Francisco in 1898, and in other cities as time went on. Many of the products developed half a century or more ago are still widely used today and with their original brand names. Old-time pharmacists will recall the popularity that greeted the introduction of its instantly soluble hypodermic tablets and gelatin-coated pills.

The history of the Mulford Biological Laboratories is equally interesting. The parent organization, the H. K. Mulford Company, had its origin in one of the oldest drugstores in Philadelphia, having operated on the same site for about one hundred and twenty-five years. One of the earlier proprietors of this store was Joseph P. Remington, who later became dean of the Philadelphia College of Pharmacy. Another was L. E. Sayre, who later became dean and professor of pharmacy at the University of Kansas.

In 1893 world-wide interest had been aroused by diphtheria antitoxin, a new treatment for diphtheria that was then available only from Europe. The Mulford Company also became interested and established the Mulford Biological Laboratories, which produced diphtheria antitoxin in 1894, the first domestic product to be offered commercially in the United States. This entirely new means of treating diphtheria was an epoch-making event in American medicine. It pioneered the way to the development and use of other biologic products for the prophylactic and therapeutic treatment of disease, which have literally saved hundreds of thousands of lives in this country and abroad.

In 1898, the company began the production of smallpox vaccine and developed many of the processes used today in preparing this product. In the intervening years sufficient vaccine for approximately one hundred million vaccinations has been produced.

The list of biological products either developed or first offered commercially by the Mulford Laboratories is long and impressive.

In the fall of 1929 the businesses of both these makers of fine pharmaceuticals and fine biologicals was combined under the name of Sharp and Dohme. During the past fifteen years the company has registered its greatest growth, more than doubling in scope and size. Over twenty-five hundred persons are employed.

More and more emphasis has been placed on research, a new research building housing a large and well-trained technical staff having been completed in 1943. Some of the more recent developments of the Sharp and Dohme laboratories include many familiar brand names. They also pioneered in the synthesis and study of sulfadiazine and sulfamerazine.

These laboratories also developed the commercial process of lyophilizing biologic products, applicable to certain labile biologicals, particularly dried blood plasma, which has been one of the most important single factors in reducing mortality among American wounded in the present war.

Sharp and Dohme has been so closely identified with the health of the nation since 1845 that its anniversary this year surely can find no better words to describe its activities during that time than "A Century in the Conservation of Life."

TUBERCULOSIS CONTROL IN HOSPITALS

Unsuspecting carriers and spreaders of the tubercle bacillus comprise a numerically small but important minority of the population. Although most general hospitals dislike to receive known cases of pulmonary tuberculosis for treatment of unrelated conditions, their patients and personnel nevertheless remain under constant threat of tuberculous infection. This condition obtains because simple, adequate measures are not taken by the institution to detect among the employees, staff and persons admitted as patients the presence of unrecognized or unreported tuberculosis. The problem is discussed in a recent paper (Block, R. G. Tuberculosis control in hospitals. *Bull. Nat. Tuberc. A.* **30**:321, 1944).

* * *

Few hospitals will accept tuberculosis of the lung as a disease to be treated within their walls except the large public institutions with special facilities for that purpose. Recently private hospitals in Chicago were asked:

> Do you admit patients with pulmonary tuberculosis to your hospital for treatment of that disease?
>
> Do you admit patients with known pulmonary tuberculosis to your hospital for treatment of other conditions?

Of the 73 hospitals that replied, 5 answered the first question with "Yes," and 68 with "No"; 25 replied to the second question with "Yes," and 48 with "No" or with comments that amounted to a negative reply. The answers indicated that hospital administrators do not consider the admission of the tuberculous an asset to hospital service. In fact many of them thought this was an attempt to uncover an administrative deficiency.

In a community with sufficient beds available in tuberculosis hospitals this attitude does not hamper phthisiotherapy, although in the past, physicians have been deprived of facilities to hospitalize their patients in this manner. With the increase of surgical treatment this has often proved hampering. In communities with inadequate facilities for the treatment of tuberculosis, failure to exploit all the available space, especially when numbers of general hospital beds were vacant, has seemed unjustified.

Fear of Infection

The reason for this is the fear of infecting nontuberculous patients and hospital personnel housed under the same roof. This precaution might be justified if the refusal could really lead to a hospital atmosphere free of tubercle bacilli, but that is not the case.

In recent years, since we have become aware of obscure tuberculosis, our distrust of a negative history and physical examination has become deep-seated and justified. Again and again, evidence has shown that any hospital may have patients with unknown and open pulmonary tuberculosis in its rooms and wards, however little the ailment for which these persons were admitted may have to do with pulmonary disease.

Routine X-ray Films of Chest

Only universal x-ray examinations of the chest of all patients, regardless of the nature of their complaint, could lead to exclusion of the tuberculous. The University of Chicago Clinics and the affiliated Provident Hospital have x-rayed all clinic admissions for some years with most beneficial results. As a method of avoiding contamination, however, this is only part of the necessary effort. As a means of keeping tuberculosis out of hospitals, pre-admission x-rays would lead to an unnecessary increase in the rejection of patients badly in need of care.

Many patients will always enter hospitals without a previous examination, and they cannot be asked to leave if tuberculosis is discovered. Even if a discharge could be effected without harm to the patients, where should they go for treatment? Tuberculosis hospitals could hardly be expected to engage in the treatment of all extrapulmonary, nontuberculous conditions. Sanatoriums are usually not located or staffed for the purposes of general medicine and surgery. Many communities have no facilities specifically intended for the treatment of patients with tuberculosis.

Danger of Unrecognized Tuberculosis

General hospitals should accept the necessity of housing tuberculous patients. The danger of infection arises from not recognizing their pulmonary infection, as has been the unavoidable fact up to now.

Proper isolation in one wing, floor or section of the building is easily accomplished. At the University of Chicago Clinics this has been done during the past twelve years.

Through knowing who and where our tuberculous patients are we are avoiding the most acute danger of contamination, which always arises where germs are being spread without the knowledge of either the distributor or the recipient.

Staff Examination

Isolation protects the medical and nursing staff and other employees against infection from the patient. To make tuberculosis control in a hospital complete, however, physicians, nurses, attendants and so forth, have to be protected not only from patients but from each other, and patients have to be guarded against infection from members of the personnel.

Nearly fifteen years ago, when the University Clinics introduced x-ray examination of the chest by roentgenograms for all nurses, the supervisor of the operating rooms and the nurse in charge of the sterilizing room for the newborn were found with active tuberculosis. Neither was aware of her condition. Stereoscopic roentgenograms were then made obligatory for all physicians and nurses on taking employment, with re-examinations every year for those on general duty and every three months for the personnel of the tuberculosis division.

General Hospital Personnel

Other personnel were exempt from this routine. About a year later, positive sputum findings began to be reported in patients where no other findings suggested tuberculous infection. The clinical findings in most of these patients suggested upper respiratory or bronchitic involvement. The suggestion that an x-ray examination of the chest of the members of the laboratory staff be made was resented by that staff and rejected by administrative officers.

Eventually, it was found that the laboratory worker in charge of sputum tests, a plump and healthy appearing girl, had extensive cavernous tuberculosis with an almost pure culture of acid-fast bacilli in her sputum. She had contaminated the patients' specimens. The embarrassment of apologizing to the patients in question and of revoking the reports to the health department had a most beneficial effect. Roentgen examination of the chest has since been obligatory for all staff members and hospitals employees and has been gratefully received by almost all of them.

Sincere Effort Needed

Experiences like this may seem extraordinary. The author believes they appear so only because there has been no great drive to uncover tuberculosis in hospital personnel. There can be no cause for the hesitation on the part of the general hospital to put its house in order with regard to tuberculosis other than inertia and the fear of administrative commotion.

A painstaking design and observance of rules governing the diagnosis and isolation of the disease in patients and employees will make it possible with safety to admit tuberculous patients to general hospitals. There is no reason why all this cannot be accomplished by voluntary efforts. It is obvious from our newer experience with tuberculosis that such hospitalization is one of the great necessities to achieve the basic aim of all medical endeavor — the saving of human life. — Reprinted from *Tuberculosis Abstracts* (January, 1945).

NOTE

The following appointments to the teaching staff at Harvard Medical School have recently been announced: Henry Merton Baker, of Boston (A.B. Washington Missionary College 1918, M.D. College of Medical Evangelists 1922), instructor in psychiatry; Clifton John Bennett, of San Francisco (A.B. University of California 1938, A.M. University of California 1940, M.D. Johns Hopkins University 1943), assistant in surgery; Frances Jones Bonner, of Greensboro, North Carolina (A.B. Bennett College 1939, M.D. Boston University 1943), assistant in neurology; William Charles Bridges, of Tacoma, Washington (S.B. University of Washington 1936, M.D. Yale University 1940), research fellow in medicine; Ellen Brown, of Berkeley, California (A.B. University of California 1934, M.D. University of California 1939), research fellow in physiology and fellow of the Commonwealth Fund; Francis Ferenc Foldes, of Boston (M.D. University of Budapest 1934), assistant in medicine; Lorye Edward Hackworth, of Sheffield, Alabama (S.B. Florence, Alabama, State Teachers College 1936, S.M. University of Alabama 1938, M.D. Harvard University 1943), assistant in surgery; Elena Jacoby Hoffman, of Santiago, Chile (M.D. University of Freiburg 1928) research fellow in physiology; Francisco Lachnit Hoffmann, of Santiago, Chile (M.D. University of Chile 1928) research fellow in physiology; Albert Aurelius Hornor, of Brookline (A.B. University of Virginia 1907, M.D. Harvard University 1911), instructor in tropical diseases; Lucie Ney Jessner, of Cambridge (Ph.D. University of Frankfurt 1920, M.D. University of Koenigsberg 1926), instructor in psychiatry; Robert Harris McCarter, of New York City (A.B. Princeton University 1938, M.D. Jefferson Medical School 1942), assistant in psychiatry; Frank Lothar Plachte, of Boston (Ph.D. Boston University 1942, M.D. Harvard University 1943), research fellow in pediatrics; Robert Maurice Ravven, of Waban (A.B. Harvard University 1939, A.M. Harvard University 1940, M.D. Harvard University 1944) assistant in psychiatry; Sidney Seymour Sobin, of the University of Michigan (S.B. University of Michigan 1935, A.M. University of Michigan 1936, Ph.D. University of Michigan 1938, M.D. University of Michigan 1941), research fellow in physiology and fellow of the National Research Council; Malwina Stock, of Boston (M.D. University of Lausanne 1939), assistant in psychiatry; Paul Francis Ware, of Newton Center (A.B. Holy Cross College 1938, M.D. Harvard University 1943), assistant in surgery; James Wendell Watson, of Grand Island, Nebraska (S.B. California Institute of Technology 1939, M.D. University of Pennsylvania 1943), assistant in psychiatry; Louis Weinstein, of Brighton (S.B. Yale University 1928, S.M. Yale University 1930, Ph.D. Yale University 1931, M.D. Boston University 1943), assistant in infectious diseases; Henry Wermer, of Brighton (M.D. University of Vienna 1936), instructor in psychiatry; and James Martin Woodall, of Boston (A.B. Mercer University 1922, M.D. Harvard University 1930), instructor in psychiatry.

BOOK REVIEWS

Radiation and Climatic Therapy of Chronic Pulmonary Diseases: With special reference to natural and artificial heliotherapy, x-ray therapy and climatic therapy of chronic pulmonary diseases and all forms of tuberculosis. Edited by Edgar Mayer, M.D. 8°, cloth, 393 pp., with 46 illustrations. Baltimore: Williams and Wilkins Company, 1944. $5.00.

This volume was written by twenty-two collaborators and edited by Dr. Edgar Mayer, long a student of light therapy in pulmonary tuberculosis. The book deals with artificial light, solar radiation, climatotherapy, x-ray therapy and, finally, surgical versus conservative treatment of bone and joint tuberculosis. The concluding chapter is a résumé by the editor of the effects of climatic, x-ray and light therapy on chronic pulmonary diseases and all forms of tuberculosis. In the first chapter, the editor states that he incorporated both skeptical and enthusiastic reports, although an attempt was made to appraise both groups quite objectively. He further agrees that, in some chapters, the deductions are based too frequently on clinical impressions and uncontrolled observations. The reviewer keenly appreciates this point, since many problems relating to the biophysics and physiology of radiation are as yet little understood and await further biophysical as well as clinical study.

The chapters covering the physics of light radiation, especially the one on the physiologic action of light, contain a great deal of valuable information and present to the reader up-to-date information on the effects and dangers of light therapy. Sources of light from the sun, the carbon-arc lamp, the quartz mercury-vapor lamp and the cold quartz lamp are adequately discussed from the physical angle, as well as from the point of view of biophysics and therapeutics. X-ray therapy is recommended in some nontuberculous diseases of the chest, such as actinomycosis, carcinoma and unresolved pneumonia; it is considered beneficial in some extrapulmonary forms of tuberculosis, dubious in tracheobronchitis, and dangerous in pulmonary tuberculosis. The influence of the climate and weather on the human organism in health and in disease is considered in detail, as is climatic therapy of nontuberculous chronic pulmonary diseases. Finally, an attempt is made to evaluate surgical versus conservative treatment in bone and joint tuberculosis.

Dr. Mayer has been in the forefront the past two decades as a student of light therapy. The pooling together in one

book of the experiences of twenty-two eminent men in the field of light therapy makes this book a "must" on the library shelves of anyone interested in tuberculosis and chronic pulmonary diseases. Skeptics will find much, as the editor has pointed out, that is unscientific or empiric. Yet, the text, with its many illustrations, contains a large amount of material that is useful and fundamental for an understanding of present-day knowledge concerning these forms of therapy. The book brings into fruition the many years of laboratory and clinical study by the collaborators as well as by the editor. Although it constitutes a summary of a controversial subject, the book adds a welcome chapter to medical literature.

Bacterial Infection: With special reference to dental practice. By J. L. T. Appleton, D.D.S., Sc.D. Third edition, thoroughly revised. 8°, cloth, 498 pp., with 86 engravings and 5 plates. Philadelphia: Lea and Febiger, 1944. $7.00.

This is a real textbook of dental bacteriology. The author lays out the broad general basis of bacteriology and immunology in the early chapters, drawing abundant example and application from dental theory and practice. It is therefore hardly a text for teachers who give dental students a course in general medical bacteriology and then leave to uncritical clinicians the special application.

As the title implies, much of the subject matter consists of a discussion of infection and the factors affecting its occurrence. The author's discussions are brief and pointed, with references to more extended reading for the unconvinced. Unfortunately, the references themselves are not always convincing.

If courses could be radically revised as soon as a vital new text appears, this book would gain quick acceptance as a text. Until then it will serve as a useful and stimulating sourcebook and one whose usefulness is not limited to the dental bacteriologist.

Infections of the Peritoneum. By Bernhard Steinberg, M.D. With a foreword by Frederick A. Coller, M.D. 8°, cloth, 455 pp., with 45 illustrations and 21 tables. New York: Paul B. Hoeber, Incorporated, 1944. $8.00.

This book, which "it is hoped will be read by the practitioner," will find, nevertheless, a more sympathetic understanding among those in the vanguard of scientific progress. Although the subject is comprehensively dealt with, the special feature of this volume is the presentation of data gathered over many years from the author's own research efforts.

The evidence deduced by the author from these data may be summarized briefly as follows: Peritonitis is a rapidly diffusing infection of the peritoneal cavity in which the exudate obtained by needle puncture is of considerable diagnostic and prognostic value. In the early stage, the average oil-immersion field shows none to 6 free bacteria, whereas the small to moderate number (average, 4000 per cubic millimeter) of neutrophilic polymorphonuclear leukocytes, which make up 85 to 90 per cent of the cells, contain 1 to 10 ingested bacteria, usually of a single species. In the moderately advanced stage, these leukocytes increase to from 60,000 to 250,000 cells per cubic millimeter, the number of free bacteria increases, and a mixed flora may be present. In the late stage, exfoliated mesothelial cells, many of which are degenerated, increase, often to 20 per cent of the cell count; the polymorphonuclears show a high proportion of stab forms and contain many phagocytosed bacteria; the leukocytes decrease in number, many being degenerated; and 10 or more bacteria, almost always more than one species, are seen free in each oil-immersion field. The quality of the defense is reflected in the richness of leukocytic mobilization, the freedom of the leukocytes from degenerative changes, the effectiveness of the phagocytosis of bacteria, the absence of red cells and the relative absence of mesothelial cells. Virulence of the organism and resistance by the host alter these features in varying directions. The safety of needle puncture is stressed and its value in diagnosis will not be disputed by anyone who has had some experience with it in doubtful cases.

The second specific contribution discussed in this volume is the intraperitoneal administration of "coli-bactragen." This is a mixture of a specially prepared colon-bacillus vaccine, aleuronat and gum tragacanth in salt solution and is recommended for mobilization of the polymorphonuclear leukocytes in the early stages of peritonitis and as a prophylactic against peritonitis in bowel surgery. The clinical evidence for the therapeutic virtues of coli-bactragen is not extensive enough to be convincing, and the author is duly cautious in his claims for its value.

Many interesting experimental data are presented on the peritoneal defense against infection and the value of various therapeutic agents, such as morphine, pituitary extracts and posture. The conclusions reached on the whole reflect the principles guiding surgeons whose therapy is based on critical appraisal of the scientific evidence. Exception may be taken to the impression left by the author that antiserums for colon-bacillus and gas-bacillus infections have a demonstrated clinical therapeutic value. Exception may also be taken to the author's interpretation that statistical evidence does not prove the usefulness of sulfonamides in abdominal surgery (penicillin is not mentioned).

One encounters statements of doubtful validity here and there: "The serum protein becomes concentrated as a result of greater nitrogen catabolism" (page 77); "For the duration of the first few days of peritonitis morphine sulphate will control pain and intestinal distention" (page 214) (there is no good evidence that morphine will control distention); "The incidence of pulmonary complications can be reduced appreciably by frequent inhalations of carbon dioxide" (page 214) (the value of carbon dioxide for this purpose has not been demonstrated, and its use has been abandoned by clinics that were among the first to recommend it). On page 241 the author recommends coli-bactragen in conjunction with the operative treatment of gonorrheal peritonitis; this implies that operative treatment has a place in the therapy of such cases, which is not generally accepted. The author's discussion of shock reflects the widespread fallacy that hemoconcentration is a characteristic feature of shock (it should be evident that hemoconcentration is present in burns and other states in which plasma loss predominates but not in conditions in which whole blood is lost, for example, in hemorrhage, or in which no blood is lost, for example, severe generalized infections.

There is much that is repetitious in this volume, but the reviewer believes that this and a tendency to prolixity are defects that a further edition could remedy. Perhaps the author, having in mind the student and the immature practitioner, may regard such criticism as irrelevant. In any case, the book has considerable merit, not the least of which is a splendid and comprehensive bibliography following each chapter.

Physical Medicine in General Practice. By William Bierman, M.D. 8°, cloth, 654 pp., with 310 illustrations and frontispiece. New York: Paul B. Hoeber, Incorporated, 1944. $7.50.

The Government has rationed food, clothes and transportation but not words. Rationing of the last was left for the author of this book. Dr. Bierman's concise style of writing and his economy of words stood him in good stead in producing the present volume. In a relatively limited space he has covered practically the entire field of physical medicine. The thoroughness that characterized his previous works, in which he dealt with single subdivisions of this subject, such as fever therapy and short-wave current, has been retained in a measure in this more general book. It is regrettable, however, that electrophysics is not treated so consummately as are the physiologic effects produced by the various physical measures. By way of an illustration, a brief discussion of such a basic matter as the electron theory of matter and the relation of electricity and magnetism, which forms the basis of induction, is omitted. Nor is it clear why he saw fit to treat the testing the neuromuscular units for the reaction of degeneration and the sinusoidal and faradic currents, as well as static electricity, under the main heading of "Galvanic Current." But these points are of minor importance and will probably be corrected in subsequent editions, which will undoubtedly be numerous, since the text as a whole is meritorious.

The book covers the usual subjects that are treated in similar works, such as, thermotherapy, phototherapy, electrotherapy, hydrotherapy and electrodiagnosis. In addition it contains chapters on massage, exercise and occupational therapy, subjects with which the general practitioner, as a rule, is not sufficiently familiar to derive from them the great advantage that they offer in the treatment of numerous injuries and certain forms of paralysis.

The final quarter of the book, which is devoted to a discussion of the treatment of specific diseases commonly affecting the systems and structures of the body, will be of inestimable help to the general practitioner provided he has familiarized himself with the preceding chapters, which treat the fundamentals of physical medicine.

Numerous detailed drawings and an appendix covering specifications for physical-therapy equipment are additional features of value.

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

Segmental Neuralgia in Painful Syndromes. By Bernard Judovich, M.D., instructor in neurology, Graduate School of Medicine, University of Pennsylvania, clinical instructor in neurology, Women's Medical College, and chief of Neuralgia Clinics, Philadelphia General Hospital, Graduate Hospital, and Women's Medical College Hospital, Philadelphia; and William Bates, M.D., professor of surgery, Graduate School of Medicine, University of Pennsylvania, consulting surgeon, Babies' Hospital and Philadelphia Home for Incurables, and consulting general surgeon, Wills Hospital, Philadelphia. With a foreword by Joseph C. Yaskin, M.D., professor of neurology, Graduate School of Medicine, University of Pennsylvania, Philadelphia. 8°, cloth, 320 pp., with 178 illustrations. Philadelphia: F. A. Davis Company, 1944. $5.00.

This monograph on a subject formerly known as intercostal neuralgia emphasizes the clinical and therapeutic aspects of segmental syndromes. The clinical value of tenderness is stressed, and much space is devoted to therapy, especially the technic of nerve infiltration. Abdominal-wall neuralgias and other conditions often mistaken for visceral organic disease are thoroughly discussed. Current literature has not been utilized in the writing of this monograph, but it is well illustrated and a number of case histories are inserted in the text.

Artificial Pneumothorax in Pulmonary Tuberculosis, Including Its Relationship to the Broader Aspects of Collapse Therapy. By T. N. Rafferty, M.D., with an introduction by Henry S. Willis, M.D., superintendent and medical director, William H. Maybury Sanatorium, Northville, Michigan. 8°, cloth, 192 pp., with 26 illustrations and 14 tables. New York: Grune and Stratton, 1944. $4.00.

The purpose of this monograph is to compare and evaluate existing standpoints and practices in the use of artificial pneumothorax in the treatment of pulmonary tuberculosis. The book is divided into three parts: general considerations, the choice of cases and management of the procedure.

Technic of Electrotherapy and Its Physical and Physiological Basis. By Stafford L. Osborne, M.S., Ph.D., assistant professor, Department of Physical Therapy, Northwestern University Medical School; and Harold J. Holmquest, B.S., B.S. (M.E.), lecturer in applied physics, Department of Physical Therapy, Northwestern University Medical School. 8°, cloth, 780 pp., with 240 illustrations and 72 tables. Springfield, Illinois: Charles C Thomas, 1944. $7.50.

This textbook is intended to provide a sound physical and physiologic rationale for the technic and application of electrotherapy; it is not intended to replace clinical textbooks but should be used to supplement such treatises. The work is based on lectures given for the past sixteen years at Northwestern University Medical School. The subject matter is divided into four parts: effects and technical application of direct current; electrical muscle stimulation; radiation; and high-frequency currents. The book is well documented and printed in a good type.

The Neurosurgical Patient: His problems of diagnosis and care. By Carl W. Rand, M.D., clinical professor of neurological surgery, University of Southern California School of Medicine. 8°, cloth, 576 pp., with 121 illustrations. Springfield, Illinois: Charles C Thomas, 1944. $4.00.

This new book is based on clinical discussions with students of the neurosurgical department of the Los Angeles County General Hospital, where medical students are assigned cases for review. The discussions are given in a conversational rather than textbook style, and complicated technical terms have been avoided. Informal clinics on fifty-four different subjects are presented in four sections: the spine, head injuries, the brain and miscellaneous conditions.

The Pathogenesis of Tuberculosis. By Arnold R. Rich, M.D., associate professor of pathology, Johns Hopkins University School of Medicine. 4°, cloth, 1008 pp., with 89 illustrations, 20 tables and 4 charts. Springfield, Illinois: Charles C Thomas, 1944. $10.50.

This important new book presents the basic factors and principles that influence the occurrence of tuberculous infection or determine its progression or arrest. The work is well documented, and a list of 1417 selected references is appended to the text. The book is well printed, with a good legible type on good paper.

Rebel Without a Cause: The hypnoanalysis of a criminal psychopath. By Robert M. Lindner, Ph.D., United States Public Health Service (R), psychologist, United States Penitentiary, Lewisburg, Pennsylvania, and lecturer in criminology, Bucknell University. With an introduction by Sheldon Glueck, LL.B., Ph.D., professor of criminal law and criminology, Law School, Harvard University, and Eleanor T. Glueck, Ed.D., research criminologist, Law School, Harvard University. 8°, cloth, 296 pp. New York City: Grune and Stratton, 1944. $4.00.

This volume portrays the basic characterologic factors in the life of a young criminal and reconstructs the mental history of an abnormal personality from earliest infancy through a perverted law-breaking boyhood to young manhood in a penitentiary environment, as revealed through a combined technic of psychoanalysis and hypnosis.

Lippincott's Quick Reference Book for Medicine and Surgery: A clinical, diagnostic and therapeutic digest of general medicine, surgery and the specialties, compiled systematically from modern literature. By George E. Rehberger, M.D. Twelfth edition. 4°, cloth, 1460 pp., with 305 illustrations. Philadelphia: J. B. Lippincott Company, 1944. $15.00.

This standard reference work, first published in 1920, has been thoroughly revised and brought up to date. The sections on gynecology and genitourinary diseases have been entirely rewritten. The list of drugs has been revised in accordance with the twelfth revision of the *United States Pharmacopeia* and the seventh edition of the *National Formulary*. The book is divided into eleven parts, dealing with different fields of medicine, and each disease or disorder is arranged alphabetically and is described clinically, its diagnosis, etiology, prognosis and treatment being considered in this order. All material is made available through a comprehensive index. This volume should prove valuable as a ready reference work for the general practitioner.

NOTICES

BOSTON SOCIETY OF BIOLOGISTS

A meeting of the Boston Society of Biologists will be held in the Main Lecture Room of the Harvard Biological Laboratories on Wednesday, February 21, at 8 p.m.

PROGRAM

A Study of Fibrin with Acid and Basic Dyes. Drs. M. Singer and P. R. Morrison.
Use of Stains in Electron-Microscope Investigation of Protein Structure. Miss M. A. Jakus.
Double Refraction of Flow as a Method for Studying Long Molecules. Dr. J. T. Edsall.
Some Recent Advances in Radioactive Tracer Technics. Dr. R. D. Evans.

(*Notices continued on page xvii*)

NOTICES (*Continued from page 210*)

SOCIETY MEETINGS AND CONFERENCES

Calendar of Boston District for the Week Beginning Thursday, February 22

Friday, February 23

*9:00–10:00 a.m. Protein Nutrition in Problems of Medical Interest. Dr. Fredrick J. Stare. Joseph H. Pratt Diagnostic Hospital.

10:50 a.m. Postgraduate clinic in dermatology and syphilology. Amphitheater, Mallory Building, Boston City Hospital.

Saturday, February 24

*10:00 a.m.–12:00 m. Medical staff rounds. Peter Bent Brigham Hospital.

Monday, February 26

*12:00 m.–1:00 p.m. Clinicopathological conference. Peter Bent Brigham Hospital.

Tuesday, February 27

*12:15–1:15 p.m. Clinicoroentgenological conference. Peter Bent Brigham Hospital.

Wednesday, February 28

*9:00–10:00 a.m. Penicillin in Venereal Disease. Dr. Oscar F. Cox. Joseph H. Pratt Diagnostic Hospital.

*12:00 m. Clinicopathological conference. Children's Hospital.

7:15 p.m. Graduate seminar in pediatrics. Children's Medical Service. Amphitheater 3A, Massachusetts General Hospital.

*Open to the medical profession.

February 19. American Board of Internal Medicine. Page 436, issue of September 21.

February 21. Greater Boston Medical Society. Page 180, issue of February 8.

February 21. Boston Society of Biologists. Page 210.

February 28. Tufts Medical Alumni Lecture. Page 180, issue of February 8.

March 8. Certain Neurological Problems as Regards Children: Diagnosis and treatment. Dr. Franc D. Ingraham. Pentucket Association of Physicians. 8:30 p.m. Haverhill.

March 14. New England Pediatric Society.

April 30. New York Institute of Clinical Oral Pathology. Page 120, issue of January 25.

May 22-24. Hotel Statler, Boston. Annual meeting of the Massachusetts Medical Society.

September 17. American Public Health Association. Page 752, issue of November 30.

District Medical Societies

PLYMOUTH

March 15. Goddard Hospital, Brockton.
April 26. Toll House, Whitman.
May 17. Lakeville Sanatorium, Lakeville.
All meetings will be held at 11 a.m.

WORCESTER

March 14. Worcester Memorial Hospital.
April 11. Hahnemann Hospital, Worcester.
May 9. Annual meeting.

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Example of severe rickets in a sunny clime.

LEST WE FORGET—we who are of the vitamin D era—severe rickets is not yet eradicated, and moderate and mild rickets are still prevalent. Here is a white child, supposedly well fed, if judged by weight alone, a farm child apparently living out of doors a good deal. This boy was reared in a state having a latitude between 37° and 42°, where the average amount of fall and winter sunshine is *equal to that in the major portion of the United States*. And yet such stigmata of rickets as *genu varum* and the quadratic head are plain evidence that rickets does occur under these conditions.

How much more likely, then, that rickets will develop among city-bred children who live under a smokepall for a large part of each year. True, vitamin D is more or less routinely prescribed nowadays for infants. But is the antiricketic routinely administered in the home? Does the child refuse it? Is it given in some unstandardized form, purchased from a false sense of economy because the physician did not specify the kind?

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